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REPORT OF A MARINE MAMMAL SURVEY OF THE EASTERN TROPICAL PACIFIC ABOARD THE RESEARCH VESSEL McARTHUR JULY 28 - DECEMBER 6, 1988

Stephanie N. Sexton
Rennie S. Holt
Alan Jackson

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Center

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Alan Jackson

In 1984, as a result of an amendment to the Marine Mammal Protection Act of 1972, the National Marine Fisheries Service (NMFS) was mandated to conduct a research program to monitor trends in the abundance of stocks of dolphins in the eastern tropical Pacific (ETP). These dolphins are killed incidentally during fishing operations by the U. S. purse seine fishery for yellowfin tuna (Thunnus albacares). In 1986, the Southwest Fisheries Center (SWFC) of the NMFS initiated a six-year program to monitor these stocks of dolphins. In the first two years of the program (1986 and 1987), two surveys of marine mammal populations in the ETP were conducted concurrently each year aboard the National Oceanic and Atmospheric Administration vessels the David Starr Jordan and the McArthur. The surveys lasted 120 days each. In 1988, the third two surveys were conducted during the same time period and using the same vessels.

In this report, we describe the experimental procedures used during the 1988 surveys and we present summaries of the distance searched and marine mammals encountered from aboard the McArthur (Cruise AR 88-02; SWFC Observer Cruise 1165). A separate report of the David Starr Jordan cruise has been published by Holt and Sexton (1989). A report of environmental data collected during the survey is reported by Lierheimer et al. (1989).

SURVEY OBJECTIVES

The primary objective of the cruise was to collect information to calculate relative abundance of dolphin species in the ETP that are taken incidentally by the purse seine fishery for yellowfin tuna. Specific objectives were to collect information to:

1. estimate school density, school size, and species composition of each species taken by the fishery;
2. investigate the physical and biological environment of the affected species; and
3. contribute to on-going U.S. and international programs investigating oceanography and ocean-atmosphere interactions in the ETP.

MATERIALS AND METHODS

Study Area and Itinerary

The McArthur traversed predetermined tracklines in the ETP from July 28 through December 6, 1988 (Figure 1), with scheduled port calls in Hilo, Hawaii; Rodman Naval Station, Panama; and Callao, Peru. The itinerary of the vessel included four segments or effort legs:

Leg 1.

Departed	San Diego	July 28
Arrived	Hilo	August 26

Leg 2.

Departed	Hilo	August 31
Arrived	Rodman NS	September 30

Leg 3.

Departed	Rodman NS	October 4
Arrived	Callao	November 2

Leg 4.

Departed	Callao	November 7
Arrived	San Diego	December 6

The McArthur also conducted bird censuses on the Archipelago del Colon (Ecuador), Isla de Malpelo (Colombia), and the Isla del Coco (Guatemala).

Scientific Personnel

Cruise Leaders

Legs

Rennie Holt, SWFC	1
Steve Reilly, SWFC	2
Andrew Dizon, SWFC	3
Douglas DeMaster, SWFC	4

Identification Specialists

Michael Newcomer, SWFC	1-2
Scott Sinclair, SWFC	1-2
Marc Webber, SWFC	3-4
Richard LeDuc, SWFC	3-4

Observers

Sallie Beavers, SWFC	1-2
William Irwin, SWFC	1-2
Keith Rittmaster, SWFC	1-2
Victoria Thayer, SWFC	1-2
Scott Benson, SWFC	3-4
Carrie Fried, SWFC	3-4
Joe Raffetto, SWFC	3-4
David Skordal, SWFC	3-4

Bird Census and Oceanographic Specialists

John Gill, Contractor	1
Karen Bluth, Contractor	1
Jim Caretta, Contractor	2
Michele Roest, Contractor	2-3
Robert Pitman, SWFC	3-4
Lisa Ballance, SWFC	4

Marine Mammal Species Surveyed

During the survey, the observers recorded information on all species of whales and dolphins sighted throughout the cruise. However, encounter rates are presented only for dolphin species.

Equipment

The McArthur, commissioned in 1966, is 53.3 m in length and 11.6 m in breadth, and has a 3.7 m draft. During the surveys, the vessel maintained a cruising speed of approximately 18.5 km/hr.

Several pieces of equipment were used to gather data. The geographic position of the vessel was recorded periodically and at the time of a marine mammal sighting using the vessel's Satellite Navigation System (SAT NAV). Marine mammals were detected with port and starboard pedestal mounted 25X Fuginon¹ binoculars and a variety of hand-held 7-15X binoculars. The glasses were mounted on the upper deck approximately 10.7 m above the sea surface. Surface temperature and salinity, fluorescence (chlorophyll), and temperature-depth profiles were obtained using a thermosalinograph, fluorometer, and expendable bathythermograph (XBT), respectively. Discrete conductivity and temperature-depth profiles were also obtained using conductivity-temperature-depth (CTD) probes.

The bearing and radial distances of marine mammals from the vessel were calculated using two methods. First, the Computer

¹Reference to trade name does not imply endorsement by the NMFS.

Assisted Sighting Technology (CAST) system used information from several sensors to measure sighting angles and then to calculate radial distances. A CAMAC¹ computer collected data from various sources: the vessel's course from the gyroscope; the electronically encoded train angles of the 25X binoculars; a measurement of the relative motion of the vessel from a pitch-roll sensor; speed from the speed log; and information concerning survey status, such as identification of observers occupying survey positions from data pads located on the flying bridge. An IBM-compatible computer, which was interfaced with the CAMAC, was then used to process information to determine the sighting angle to the cue. Successive sighting angles, recorded as the vessel traveled along the trackline, were used to calculate radial distances. Analyses of CAST data will be presented in a separate report.

The second method was the use of estimates of the bearing and radial distance of a school from the vessel, which were recorded by the observers using a 360° graduated washer attached to the base of the 25X binoculars and graduated reticles enclosed in the right eye piece of the binoculars.

A 35 mm F-1 Canon¹ camera with motor drive was used to photograph animals to aid in stock and species identification. The system included 400 mm, 75-210 mm zoom, and 28 mm lens. Some observers also used personal camera equipment to photograph sightings. Animals were also recorded on 1.27 cm video tape using a Panasonic¹ VHS recorder and a Panasonic¹ camera equipped with telephoto lens.

Duty Stations

Three duty stations were used during the survey, with observers rotating through each station.

1. Left Binocular - The port-side observer used a 25X binocular, mounted on the port side of the vessel to scan the ocean for marine mammal sighting cues. The major area of responsibility for this observer was from the midpoint of the trackline to abeam the port-side of the vessel and outward to the horizon or to the extent possible with prevailing environmental conditions.
2. Right Binocular - The starboard observer used a 25X binocular, mounted on the starboard side of the vessel, to search from the midpoint of the trackline to abeam the right side of the vessel; and outward to the horizon or to the extent possible with prevailing environmental conditions. Observers in the left and right positions frequently searched areas on the opposite side of the tracklines.

3. Recorder - The recorder's duties were to transcribe effort data at regular intervals, to make notes of information pertaining to each sighting, and, when possible, to search the trackline adjacent to the vessel with hand held binoculars for schools not detected by the observers on the 25X glasses.

Observer Teams and Rotation

Two teams of three observers each alternately occupied the three duty stations. Each team was on duty for two-hour shifts. During each shift members spent approximately equal time occupying each duty station. Two of the six observers were experts in identifying marine mammals. These two identification specialists were assigned to separate teams so that one would always be on duty. The other four observers were systematically assigned to a team. Team members remained constant during the entire survey. Team members rotated among the duty stations and teams rotated on and off duty without interrupting searching effort. Teams alternated completing the first watch of the day. Observers aboard the Jordan and McArthur switched vessels after the second leg.

Data Collection Procedures

A typical day's searching activity began at sunrise, approximately 0630 hours local time, and ended at sunset, approximately 1830 hours local time. The searching procedure was initiated when observers were occupying the duty stations and a recorder was in place to record information on the Research Vessel Effort Form (Figure 2). The vessel traversed a predetermined trackline at a constant speed of approximately 18.5 km/hr. Except for approximately two to three hours per night when oceanographic data were collected, the vessel maintained its speed and course between sunset and sunrise to provide wider spatial distribution of searching effort.

When a sighting cue (marine mammals, birds, splashes, etc.) was detected, it was determined if the cue was a marine mammal and if the cue was appropriate for tracking using the CAST system. Schools that were not tracked included whales, dolphins detected close to the vessel or at distances greater than 5.6 km lateral to the vessel, small schools of dolphins (<15 animals), and schools detected during poor sighting conditions. If tracking was appropriate, the searching effort was terminated and the observer began tracking by turning on a switch attached to the binocular stand. With the vessel still on course and with the school in the field of view of the binoculars, the CAST system recorded successive bearings of the animals to the vessel. After approximately 8 minutes the vessel was directed towards the cue and the tracking continued for another 8 minutes. When the target was not in the field of view, the switch was deactivated until the target was again sighted. At the end of the tracking sequence, if the target was lost from view and not resighted, or if the cue was

not a marine mammal, the tracking procedure was terminated. All marine mammal schools were approached to obtain estimates of school size and species composition. The searching mode was resumed when the vessel returned to course and speed and the observers resumed searching for other sighting cues.

During each marine mammal sighting, the recorder collected data to complete Research Vessel Effort and Research Vessel Sighting forms (Figure 3). Definition of each data element is given by Ralston². Criteria for assigning sun position and sea state conditions are given in Figure 4 and Table 1, respectively. Observers recorded bearing and range for schools using the 360° washer and reticle increments. The reticle measurements were converted to km using

$$a = 0.003942 \tan (\arctan (45242.52) - 0.001088 r),$$

where a equals radial distance in km and r denotes the number of reticles below the topmost reticle. Values in this equation were calculated by Barlow (per. comm.) using an equation presented by Smith (1982) and data collected during previous research vessel cruises.

Each observer who had a good view of the school independently recorded in his or her logbook an estimate of school size and a determination of species composition. All available observers determined species identification and animal behavior, and a consensus was entered on the Research Vessel Sighting and Research Vessel Continuation Forms (Figure 5) at the time of a sighting. Species identifications were validated when possible by photographing the school at close range using 35 mm and video cameras.

Data Analyses

Data were recorded for each Beaufort sea state and then grouped into (1) "calm" sea state conditions without whitecaps (Beaufort numbers 0-2) or (2) "rough" sea state conditions with whitecaps (Beaufort numbers 3-5). The presence of whitecaps was important in searching for sighting cues. Animal splashes could not be used as a sighting cue during rough seas because whitecaps were easily confused with the animal splashes.

Sun location was recorded by noting its horizontal and vertical position relative to the vessel (Figure 4). Visibility effects were investigated by classifying sun positions into "good" and "poor" categories defined by the effect of the glare from the

²Ralston, F. Ms. Usage procedures and coding notes for research vessel sighting and effort records. Southwest Fisheries Center. P.O. Box 271, La Jolla, CA. 92038.

sun on the trackline. Criteria used were those described in Holt (1987). Poor sun conditions were recorded only when horizontal sun position was 12 and vertical position was 1, 2, or 3 or when there were clouds together with fog or rain. All other conditions were good conditions.

The study area was divided into four strata, with the sum of the four strata comprising the total study area (Figure 1). The sum of the three northern most strata (inshore, middle and west) constitute the northern stratum and represents the range of the northern offshore stock of spotted dolphins (species most critically impacted by the fishery). Data were analysed using information by stratum, summed over strata and pooled over strata.

The rate of encountering marine mammal schools was determined as the simple ratio of sightings detected per 1000 km searched. The standard error of the encounter rate was calculated as

$$\text{Var}(n/L) = [\sum l_i [(n_i/l_i) - (n/L)]^2]/L(R - 1)$$

where n equals the number of dolphin schools detected in the survey, L equals the km searched, l_i equals km searched during the ith day, n_i equals schools detected during the ith day, and R equals number of days searched.

Encounter rates were calculated for all dolphin schools that were detected during Beaufort states 0 through 5 (elimination of Beaufort 6 data discussed below). Rates were calculated for these schools detected in the entire study area and for schools stratified by area, species, individual Beaufort numbers, calm and rough sea conditions, good and poor sun conditions, individual observers, and observer teams.

RESULTS

Data describing each leg of searching effort during the entire survey are summarized in Table 2. Information summarized for each marine mammal sighting encountered during the survey is presented in Table 3. The geographic positions of all schools detected during the survey are presented for each species category (code) in Figures 6 through 19. Observer estimates of school size are presented by species codes in Table 4.

During the entire survey, observers searched 13,390 km and detected 513 marine mammal sightings (Table 5). Dolphins were detected in 314 schools and whales were detected in 217 schools (18 schools contained both dolphins and whales). These included 12 species of dolphins and 16 species of whales.

While operating in the searching mode in the study area

(Figure 1), observers searched 12,454 km and detected 282 dolphin schools. Searching effort was conducted during Beauforts 0 through 6 conditions, although because Beaufort 6 seas were very rough, data collected during these conditions were omitted from further analysis. During Beauforts 0 through 5, 12,349 km were searched and 281 dolphin schools were detected. The rate of detecting schools in the study area was 22.76 schools/1000 km searched (Table 6).

The McArthur's searching effort was distributed among all four strata (Table 6). In the northern area, detection rates increased with increased distance from shore. The detection rates in the inshore and middle strata were similar (Table 6).

Sea conditions in the study area were very rough; only 10% of the searching effort was completed in calm seas (Table 6). However, 20% of all schools were detected during calm seas and the rate of detecting schools during calm seas was more than twice the rate detected during rough seas.

Poor visibility conditions occurred only during 11% of the surveying effort during which 14% of the schools were detected (Table 6). Contrary to expectations, the rate of detecting schools during good conditions was lower than the rate during poor conditions.

The percent of schools detected by individual observers ranged from 1 to 16% (Table 6). Consequently, rates of detecting target schools also varied greatly (range of 1.53 to 12.27 schools/1000 km).

The percent of schools detected by teams ranged from 14 to 32% (Table 6). The rate of detecting schools by teams ranged from 14.78 to 26.12 schools/1000 km searched.

SUMMARY

In this report, we have presented data on dolphin encounter rates, school size, and species composition which meet the primary objectives of the cruise aboard the McArthur. Data on effort and sightings have been summarized. We found that the rate of encountering dolphin schools was higher during calm seas than during rough seas, and the rate during good visibility conditions was lower than the rate during poor visibility conditions. Rates were highest in the west area. Encounter rates among observers were variable.

ACKNOWLEDGMENTS

Because of the work of many dedicated professionals, the cruise aboard the McArthur was successfully executed. Among those contributing to the success of the cruise were the observers who spent many hours collecting the data, the officers and crew of the McArthur who gave their continuous support, and L. Farrar (Jordan Port Captain) who provided liaison with ship support personnel and the scientists. Critical logistical arrangements were completed by S. Sexton. William Irwin provided essential assistance with logistical preparations. Special efforts were provided in procurement by B. Engstrand and B. Watkins. Part of the manuscript was typed by C. Ratcliffe. Finally, we are grateful to I. Barrett, J. Carr, D. DeMaster, and B. Remington for their support during the entire cruise preparation and execution.

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Table 1. Sea state conditions measured by the Beaufort scale (from Bowditch, 1966).

Wind force (Beaufort)	Knots	Descriptive	Sea Conditions	Probable wave height in ft.
0	0- 1	Calm	Sea smooth and mirror-like	-
1	1- 3	Light air	Scale-like ripple without foam crests	1/4
2	4- 6	Light breeze	Small short wavelets; crests have a glassy appearance and do not break	1/2
3	7-10	Gentle breeze	Large wavelets; some crests begin to break; foam of glassy appearance. Occasional white foam crests	2
4	11-16	Moderate breeze	Small waves, becoming longer; fairly frequent white foam crests	4
5	17-21	Fresh breeze	Moderate waves, taking a more pronounced long form; many white foam crests; there may be some spray	6
6	22-27	Strong breeze	Large waves begin to form; white foam crests are more extensive everywhere; there may be some spray	10

Table 2. Daily searching effort recorded in the eastern tropical Pacific aboard the McArthur during July 28 through December 6, 1988.

series	leg	date	speed km/hr	observer codes	sun position horz. rec.	beauf. no.	course (deg.)	position latitude longitude km in leg
01	01	880730	19.45	51	38	68	2	163 28 14 n 121 41 w 8.75
01	02	880730	19.45	68	51	38	2	163 5 51
01	03	880730	19.45	68	51	38	2	175 1.30
01	04	880730	19.45	05	70	22	2	190 9.07
01	05	880730	19.45	05	70	51	2	190 0.65
01	06	880730	19.45	05	70	22	2	190 3.57
01	07	880730	19.45	70	22	05	2	190 0.97
01	08	880730	19.45	70	22	05	2	163 12.96
01	09	880730	19.45	22	05	70	2	163 3.89
01	10	880730	19.45	22	05	70	1	163 5.83
02	01	880730	19.45	22	05	70	1	163 2.59
02	02	880730	19.45	38	68	51	1	163 6.16
03	01	880730	19.45	51	38	68	2	163 9.40
03	02	880730	19.45	51	38	68	1	163 5.19
03	03	880730	19.45	68	51	38	1	163 15.56
03	04	880730	19.45	68	51	38	1	163 12.32
03	05	880730	19.45	70	22	05	12	163 4.21
04	01	880730	19.45	70	22	05	12	163 8.10
05	01	880730	19.45	51	38	68	01	163 9.40
05	02	880730	19.45	68	51	38	03	163 0.65
06	01	880730	19.45	22	05	70	03	163 12.96
06	02	880730	19.45	05	70	22	02	163 10.37
06	03	880730	19.45	05	70	22	2	163 2.27
06	04	880730	19.45	68	38	51	1	163 15.56
06	05	880730	19.45	51	68	38	1	163 0.65
07	01	880730	19.45	51	68	38	0	163 2.92
08	01	880730	19.45	51	68	38	0	163 8.43
08	02	880730	19.45	38	51	68	0	163 7.45
09	01	880730	19.45	22	70	05	0	163 2.27
09	02	880730	19.45	05	70	51	0	163 3.57
09	03	880730	19.45	05	70	51	0	163 0.32
09	04	880731	19.45	22	05	70	1	163 7.45
01	01	880731	19.45	38	68	51	1	163 7.45
02	01	880731	18.15	51	38	68	1	163 6.05
03	01	880731	18.15	51	38	68	1	163 8.10
03	02	880731	19.45	68	51	38	1	163 9.86
04	01	880731	19.08	05	70	22	05	163 13.03
04	02	880731	19.08	70	22	05	10	163 7.63
04	03	880731	19.08	22	05	70	10	163 4.13
04	04	880731	19.08	68	51	38	11	163 8.67
04	05	880731	19.26	68	51	38	2	163 12.59
04	06	880731	18.89	38	68	51	3	163 12.96
04	07	880731	18.52	51	38	68	2	163 6.10
04	08	880731	19.26	05	70	22	2	163 0.32
04	09	880731	19.26	05	70	22	3	163 4.49
05	01	880731	19.26	05	70	22	3	163 12.59
05	02	880731	18.89	68	51	38	3	163 12.59

Table 2. (continued)

series	leg	date	speed km/hr	observer left	codes	sun position horz.	beauf. vert.	course (deg.)	position latitude	km in leg
05	03	880731	18.89	38	51	3	163	23 25 n	120 05 w	10.07
05	04	880731	18.89	51	38	3	163	23 25 n	120 05 w	10.39
05	05	880731	18.89	70	05	3	163	23 10 n	120 00 w	2.20
05	06	880731	18.89	70	05	22	04	02	23 01 n	11.65
05	07	880731	18.52	05	22	70	3	163	23 01 n	4.94
06	01	880731	18.52	05	22	70	3	163	23 10 n	7.10
06	02	880731	19.08	22	70	05	3	163	23 01 n	8.58
07	01	880731	18.71	22	70	05	3	163	21 30 n	2.49
07	02	880731	18.71	22	70	05	3	163	21 30 n	0.31
01	01	880801	18.89	38	68	51	09	03	21 19 27 w	4.72
01	02	880801	18.89	38	68	51	09	03	21 16 n	8.50
01	03	880801	18.52	05	22	70	05	22	21 16 n	12.66
01	04	880801	18.52	22	70	05	22	09	21 19 23 w	12.96
01	05	880801	18.52	70	05	22	09	02	21 01 n	9.88
01	06	880801	18.52	70	05	22	10	02	21 01 n	4.94
01	07	880801	18.52	70	05	22	10	02	21 01 n	0.62
01	08	880801	18.52	51	38	68	51	5	20 47 n	13.89
01	09	880801	18.52	68	51	38	51	5	20 41 n	13.89
01	10	880801	18.52	38	68	51	4	163	20 41 n	8.64
01	11	880801	18.52	38	68	51	4	163	20 39 n	2.16
02	01	880801	18.71	05	22	70	05	5	163	20 39 n
02	02	880801	18.71	22	70	05	5	163	19 42 n	13.41
02	03	880801	18.71	70	05	22	05	22	19 42 n	12.47
02	04	880801	19.26	68	51	38	4	163	19 42 n	9.66
02	05	880801	18.71	38	68	51	4	163	20 12 n	12.84
02	06	880801	18.71	51	38	68	4	163	20 12 n	12.47
02	07	880801	18.89	05	22	70	05	22	20 12 n	12.47
03	01	880801	18.89	05	22	70	05	22	20 12 n	12.47
03	02	880801	18.89	22	70	05	22	05	20 12 n	12.47
03	03	880801	18.89	70	05	22	05	22	20 12 n	12.47
04	01	880801	18.89	38	68	51	4	163	19 42 n	0.63
04	02	880801	15.74	38	68	51	4	163	19 42 n	1.31
04	03	880801	18.89	51	38	68	51	4	163	19 42 n
04	04	880801	18.89	51	38	68	51	4	163	19 42 n
04	05	880801	18.89	68	51	38	4	163	19 42 n	3.15
05	01	880801	18.89	68	51	38	4	163	19 42 n	7.24
05	02	880801	18.89	68	51	38	4	163	19 42 n	1.26
01	01	880802	18.89	22	70	05	4	163	19 34 n	0.94
01	02	880802	18.89	68	51	38	4	163	19 34 n	0.31
01	03	880802	18.89	68	51	38	4	163	17 58 n	12.28
01	04	880802	18.89	68	51	38	4	163	17 46 n	11.33
02	01	880802	18.89	38	68	51	4	160	17 44 n	1.26
02	02	880802	18.89	38	68	51	4	160	17 40 n	7.56
02	03	880802	18.89	51	38	68	4	160	17 38 n	3.15
02	04	880802	18.89	22	70	05	4	210	17 38 n	12.91
02	05	880802	18.89	05	22	70	05	210	17 38 n	13.22
02	06	880802	18.89	70	05	22	05	210	17 20 n	13.85
02	07	880802	18.89	38	68	51	08	01	210	13.85
02	08	880802	18.89	51	38	68	08	01	210	12.28
02	09	880802	18.89	68	51	38	12	5	210	12.59
02	10	880802	18.89	22	70	05	02	01	210	12.91
02	11	880802	18.89	05	22	70	02	01	210	13.54
02	12	880802	18.52	70	05	22	02	01	210	11.65
								05	02	12.04

Table 2. (continued)

series	leg	date	speed km/hr	observer left	codes right	sun position horz. vert.	beauf. no.	course (deg.)	position latitude longitude	km in leg
02	13	880802	18.52	51	38	68	02	01	5	210
02	14	880802	18.52	68	51	38	02	02	5	210
02	15	880802	18.52	38	68	51	02	02	5	210
02	16	880802	18.52	22	05	70	03	02	5	210
02	17	880802	18.52	05	70	22	03	03	5	210
02	18	880802	18.52	05	70	22	03	03	5	210
02	19	880802	18.52	70	22	05	03	03	5	210
02	20	880802	18.52	70	22	05			5	210
01	01	880803	18.89	51	38	68			3	210
01	02	880803	18.89	70	22	05			3	210
01	03	880803	18.89	70	22	05			3	210
01	04	880803	18.89	70	22	05			4	210
01	05	880803	18.89	22	05	70	11	02	4	210
01	06	880803	18.89	05	70	22	11	02	4	210
01	07	880803	18.89	68	51	38	11	02	4	210
01	08	880803	18.89	38	68	51	11	01	4	210
01	09	880803	18.89	38	68	51	11	01	4	210
01	10	880803	18.89	38	68	51	11	01	4	210
01	11	880803	18.89	38	68	51	11	01	4	210
01	12	880803	18.89	51	38	68	11	01	4	210
02	01	880803	18.52	51	38	68	11	01	4	210
02	02	880803	18.52	70	22	05	11	01	4	210
02	03	880803	18.52	22	05	70	11	02	4	210
03	01	880803	18.52	22	05	70	12	12	3	210
03	02	880803	18.52	05	70	22	12	12	3	210
03	03	880803	18.52	68	51	38	12	12	3	210
03	04	880803	18.52	38	68	51	06	01	3	210
03	05	880803	18.52	51	38	68			3	210
03	06	880803	18.52	70	22	05			3	210
03	07	880803	18.52	22	05	70			3	210
03	08	880803	18.52	05	70	22			3	210
03	09	880803	18.52	51	38	68			3	210
04	01	880803	18.52	68	51	38			3	210
05	01	880803	18.52	68	51	38			3	210
06	01	880803	18.52	68	51	38			3	210
06	02	880803	18.52	68	51	38			3	210
01	01	880804	18.52	05	70	22	10	03	4	142
01	02	880804	18.52	05	70	22	10	03	5	142
01	03	880804	18.52	68	51	38	10	03	5	142
01	04	880804	18.52	38	68	51	10	03	5	142
01	05	880804	18.52	38	68	51	10	03	4	142
01	06	880804	18.52	51	38	68	10	02	4	142
01	07	880804	18.52	51	38	68	10	02	5	142
01	08	880804	18.52	70	22	05	10	02	5	142
01	09	880804	18.52	70	22	05	10	02	5	142
02	01	880804	18.52	22	05	70	05	10	4	142
02	02	880804	18.52	22	05	70	10	01	4	142
02	03	880804	18.52	05	70	22	10	01	5	142
02	04	880804	18.52	05	70	22	10	01	5	142
02	05	880804	18.52	38	68	51	10	01	5	142
02	06	880804	18.52	38	68	51	10	12	5	142
02	07	880804	18.52	51	38	68	10	12	5	142

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position	beauf. no.	course (deg.)	position latitude	km in leg	
				left right horz. vert. rec.						
02	08	880804	18.71	68 51	38 12	5	142 12	116 52 w	12.47	
02	09	880804	18.71	70 22	05 05	5	142 12	116 43 w	12.78	
02	10	880804	18.71	22 05	70 05	5	142 12	116 40 w	12.47	
02	11	880804	18.71	05	70 22	5	142 12	116 40 w	12.16	
02	12	880804	18.71	51 38	68 05	5	142 12	116 40 w	12.47	
02	13	880804	18.71	68 51	38 05	4	142 12	116 26 w	9.98	
02	14	880804	18.71	38 68	51 05	4	142 11	116 23 w	10.29	
02	15	880804	18.52	70 22	05 05	4	142 11	116 15 w	12.35	
02	16	880804	18.52	22 05	70 05	3	142 11	116 15 w	6.17	
03	01	880804	18.52	05	70 22	3	118 11	116 11 w	0.31	
04	01	880804	18.52	05	70 22	3	118 11	116 11 w	4.41	
01	01	880805	18.89	68 51	38 05	2	116 11	115 17 w	4.68	
01	02	880805	18.71	68 51	38 05	2	116 11	115 15 w	11.22	
01	03	880805	18.71	22 70	05 22	2	116 11	115 15 w	15.28	
01	04	880805	18.71	70 05	22 05	2	116 11	114 55 w	7.48	
01	05	880805	18.71	05 22	70 05	2	116 11	110 03 w	0.31	
01	06	880805	18.71	05 22	70 05	5	149 06	110 03 w	12.35	
01	01	880807	18.52	38 68	51 05	5	149 149	110 03 w	1.54	
01	02	880807	18.52	38 68	51 05	6	149 149	110 03 w	3.70	
01	03	880807	18.52	70 05	22 05	6	149 149	110 03 w	4.94	
02	01	880807	18.52	70 05	22 05	5	149 149	110 03 w	12.04	
02	02	880807	18.52	51 38	68 51	5	149 149	110 03 w	12.35	
03	01	880807	18.52	51 38	68 51	01	149 149	110 03 w	12.35	
03	02	880807	18.52	68 51	38 05	01	149 149	110 03 w	12.35	
03	03	880807	18.52	38 68	51 05	01	149 149	110 03 w	12.35	
03	04	880807	18.52	70 22	05 05	02	149 149	110 03 w	14.20	
03	05	880807	18.52	22 05	70 05	02	149 149	110 03 w	9.26	
03	06	880807	18.52	05 22	05 22	02	149 149	110 03 w	8.95	
03	07	880807	18.52	51 38	68 51	03	149 149	110 03 w	9.57	
03	08	880807	18.52	68 51	38 05	03	149 149	110 03 w	1.85	
04	01	880807	18.52	68 51	38 05	4	149 149	110 02 w	4.32	
04	02	880807	18.52	68 51	38 05	4	149 149	110 01 w	0.31	
01	01	880808	18.52	05 22	05 05	03	292 292	110 04 w	9.57	
01	02	880808	18.52	70 22	05 05	03	292 292	110 04 w	9.26	
01	03	880808	18.52	38 68	51 05	02	3	109 21 w	5.86	
02	01	880808	18.52	51 38	68 05	3	301 292	109 28 w	3.40	
03	01	880808	18.52	22 05	70 05	3	301 292	109 28 w	11.11	
03	02	880808	18.52	05 22	04 04	01	3	292 292	109 28 w	10.80
03	03	880808	18.52	70 22	05 05	01	3	292 292	109 28 w	6.17
03	04	880808	18.52	70 22	05 05	04	289 289	109 43 w	2.16	
04	01	880808	18.52	51 68	38 51	3	289 289	109 44 w	5.56	
04	02	880808	18.52	51 68	38 51	01	285 285	109 47 w	4.94	
04	03	880808	18.52	38 51	68 51	02	3	285 285	109 49 w	4.01
04	04	880808	18.52	38 51	68 51	12	3	285 285	109 50 w	6.79
04	05	880808	18.52	68 51	38 05	03	285 285	109 50 w	8.03	
05	01	880808	18.52	51 38	68 05	02	3	287 287	110 00 w	7.72
05	02	880808	18.52	51 38	68 05	01	3	287 287	110 05 w	1.85
05	03	880808	18.52	68 51	38 05	02	3	257 257	110 05 w	9.26
05	04	880808	18.52	38 68	51 05	01	3	257 257	110 10 w	8.64
05	05	880808	18.52	70 22	05 05	03	3	257 257	110 15 w	7.72
05	06	880808	18.52	22 05	70 05	01	3	257 257	110 20 w	0.93
06	01	880808	18.52	22 05	70 05	03	3	257 257	110 26 w	0.00

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes	sun position horz.	position vert.	beauf. no.	course (deg.)	longitude in leg	km	
	01	880809	18.52	68	38	51	3	290	05 13 n	111 24 w	16.98		
01	02	880809	18.52	05	70	22	3	290	05 13 n	111 24 w	13.89		
01	03	880809	18.52	70	22	05	02	290	05 13 n	111 24 w	13.58		
01	04	880809	18.52	22	05	70	02	290	05 21 n	112 01 w	14.51		
02	01	880809	18.52	51	38	68	3	290	05 27 n	112 06 w	2.78		
03	01	880809	18.52	68	51	38	04	01	3	290	05 27 n	12.04	
03	02	880809	18.52	05	70	22	04	01	3	290	05 27 n	6.48	
03	03	880809	18.52	05	70	22	12	12	3	290	05 27 n	5.86	
03	04	880809	18.52	70	22	05	12	12	3	290	05 32 n	11.11	
03	05	880809	18.52	70	22	05	12	12	3	296	05 32 n	1.23	
03	06	880809	18.52	22	05	70	01	01	3	296	05 32 n	12.04	
03	07	880809	18.52	38	68	51	12	01	3	296	05 32 n	3.70	
03	08	880809	18.52	38	68	51	12	01	4	296	05 38 n	5.86	
04	01	880809	18.52	38	68	51	12	01	4	296	05 38 n	1.54	
04	02	880809	18.52	51	38	68	12	01	4	296	05 38 n	11.73	
04	03	880809	18.52	68	51	38	12	01	4	296	05 42 n	8.03	
04	04	880809	18.52	68	51	38	12	01	3	296	05 42 n	2.47	
05	01	880809	18.52	05	70	22	05	12	02	3	296	05 42 n	8.64
05	02	880809	18.52	05	70	22	05	12	02	3	296	05 42 n	7.41
05	03	880809	18.52	70	22	05	12	02	02	3	296	05 42 n	3.70
05	04	880809	18.52	22	05	70	12	02	02	3	296	05 42 n	6.79
05	05	880809	18.52	22	05	70	12	03	03	3	296	05 55 n	8.03
06	01	880809	18.52	51	38	68	12	03	03	3	296	05 55 n	4.94
06	02	880809	18.52	68	51	38	12	03	03	3	296	05 57 n	0.31
06	03	880809	18.52	38	68	51	12	03	03	3	289	06 17 n	8.64
06	04	880809	18.52	38	68	51	12	03	03	3	289	06 17 n	2.47
06	05	880810	18.52	38	68	51	05	02	02	5	289	06 18 n	8.64
01	02	880810	18.52	38	68	51	05	02	02	5	289	06 18 n	2.47
01	03	880810	18.52	51	38	68	05	05	01	5	289	06 25 n	9.26
02	01	880810	18.52	22	70	05	05	05	01	5	289	06 25 n	9.26
02	02	880810	18.52	70	05	22	05	01	01	5	289	06 25 n	9.57
02	03	880810	18.52	05	22	70	05	01	01	5	289	06 25 n	1.23
02	04	880810	18.52	05	22	70	05	01	01	5	289	06 29 n	7.72
02	05	880810	18.52	68	38	51	05	01	01	5	289	06 30 n	1.23
03	01	880810	18.52	68	38	51	05	01	01	5	289	06 31 n	4.63
04	01	880810	18.52	51	68	38	12	12	01	5	289	06 32 n	7.10
04	02	880810	18.52	51	68	38	12	12	01	5	295	06 34 n	1.54
05	01	880810	18.52	38	51	68	16	22	01	4	295	06 35 n	2.16
05	02	880810	18.52	70	16	22	01	01	01	4	295	06 35 n	12.04
05	03	880810	18.52	16	22	70	12	01	01	4	295	06 35 n	3.40
06	01	880810	18.52	16	22	70	12	01	01	4	295	06 37 n	6.17
06	02	880810	18.52	22	70	16	12	01	01	4	295	06 37 n	11.73
06	03	880810	18.52	68	51	38	12	12	01	4	295	06 41 n	4.01
06	04	880810	18.52	68	51	38	11	01	01	4	330	06 45 n	6.48
07	01	880810	18.52	38	68	51	11	02	02	5	330	06 54 n	20.37
07	02	880810	18.52	70	16	22	10	02	02	5	330	06 54 n	8.95
08	01	880810	18.52	16	22	70	12	01	01	4	330	07 05 n	3.09
08	02	880810	18.52	16	22	70	12	01	01	4	330	07 07 n	0.31
06	04	880810	18.52	68	51	38	11	02	02	5	286	07 14 n	3.40
07	01	880811	20.37	68	51	38	05	05	05	5	286	07 16 n	14.60
01	02	880811	20.37	22	70	05	22	05	05	5	286	07 16 n	11.20
01	03	880811	20.37	70	05	22	05	05	02	4	286	07 16 n	4.41
01	04	880811	19.45	05	22	70	05	05	02	4	286	07 16 n	14.26

Table 2. (continued)

series	leg	date	speed km/hr	observer codes			sun position horz. vert.	beauf. no.	course (deg.)	position latitude	km in leg
				left	right	rec.					
01	06	880811	19.45	38	68	51	05	02	4	286	7.78
01	07	880811	19.45	38	68	51	05	01	3	286	6.16
01	08	880811	19.45	38	68	51	05	01	4	286	0.65
01	09	880811	19.45	51	38	68	05	01	4	286	11.34
01	10	880811	19.45	51	38	68	05	01	5	286	3.24
01	11	880811	18.52	68	51	38	05	01	5	286	13.89
01	12	880811	18.52	22	70	05	12	12	5	286	8.64
01	13	880811	18.52	22	70	05	12	12	5	283	4.01
01	14	880811	18.52	70	05	22	12	12	5	283	12.66
01	15	880811	18.52	05	22	70	12	01	5	283	11.73
01	16	880811	18.52	68	38	51	01	01	5	283	12.35
01	17	880811	18.52	51	68	38	12	01	5	283	6.48
02	01	880811	18.52	51	38	68	12	01	5	283	8.03
02	02	880811	18.52	22	70	05	12	01	5	283	10.80
02	03	880811	18.52	70	05	22	12	02	5	283	3.70
02	04	880811	18.52	70	05	22	11	02	5	313	2.16
03	01	880811	18.52	05	22	70	11	02	5	313	8.03
03	02	880811	18.52	51	68	38	11	03	5	313	10.80
03	03	880811	18.52	38	51	68	11	03	5	313	11.73
03	04	880811	18.52	68	38	51	11	03	5	313	6.79
03	05	880811	18.52	68	38	51	01	01	5	313	1.85
03	06	880811	18.52	68	38	51	05	05	5	313	0.31
01	01	880812	18.52	70	22	05	05	05	5	286	3.40
01	02	880812	18.52	70	22	05	05	05	5	300	3.09
01	03	880812	18.52	51	38	68	05	03	5	300	13.89
01	04	880812	18.52	68	51	38	05	03	5	300	13.89
01	05	880812	18.52	38	68	51	05	03	5	300	14.20
01	06	880812	18.52	22	05	70	05	02	5	300	3.40
01	07	880812	18.52	22	05	70	05	02	5	300	10.80
01	08	880812	18.52	05	70	22	05	01	5	300	10.80
01	09	880812	18.52	68	70	22	05	01	6	300	2.47
01	10	880812	18.52	70	22	05	05	01	6	300	3.09
01	11	880812	18.52	05	22	05	05	01	6	300	1.23
01	12	880812	18.52	05	22	05	05	01	6	300	0.31
01	01	880813	18.52	38	68	51	05	01	5	300	3.70
02	01	880813	18.52	22	70	05	22	05	02	500	9.26
02	02	880813	18.52	70	05	22	05	02	5	300	9.88
02	03	880813	18.52	05	22	70	05	02	5	300	6.17
02	04	880813	18.52	68	51	38	05	02	5	300	13.89
02	05	880813	18.52	38	68	51	05	01	5	300	10.80
02	06	880813	18.52	38	68	51	05	01	5	300	3.09
02	07	880813	18.52	51	38	68	05	01	5	300	4.94
03	01	880813	18.52	22	70	05	22	05	5	300	10.80
03	02	880813	18.52	70	05	22	05	02	5	300	3.70
04	01	880813	18.52	70	05	22	05	02	5	300	1.85
04	02	880813	18.52	05	22	70	12	12	5	300	6.48
04	03	880813	18.52	05	22	70	12	12	5	300	2.78
05	01	880813	18.52	51	38	68	05	01	5	300	9.88
05	02	880813	18.52	68	51	38	05	01	5	300	12.35
05	03	880813	18.52	38	68	51	05	01	5	300	12.04
05	04	880813	18.52	22	70	05	05	01	5	300	0.62
05	05	880813	18.52	22	70	05	05	01	5	300	7.41

Table 2. (continued)

series	leg	date	speed km/hr	sun left	observer codes	position horz.	beauf. no.	course (deg.)	position latitude	km in leg
				right	rec.	vert.				
06	01	880813	18.52	22	70	05	5	300	10 24 n	1.23
06	02	880813	18.52	70	05	22	5	300	10 24 n	4.94
06	03	880813	18.52	70	05	22	5	300	10 29 n	5.56
06	04	880813	18.52	05	22	70	5	300	10 29 n	4.94
06	05	880813	18.52	05	22	70	5	300	10 56 n	0.31
01	01	880814	18.52	38	51	68	5	300	10 59 n	13.58
01	02	880814	18.52	68	38	51	5	300	11 02 n	9.88
01	03	880814	18.52	68	38	51	5	290	11 02 n	1.85
01	04	880814	18.52	68	38	51	5	290	11 24 22 w	2.78
01	05	880814	18.52	51	68	38	5	290	11 24 27 w	3.70
01	06	880814	18.52	51	68	38	5	302	11 03 n	9.26
01	07	880814	18.52	70	22	05	02	302	11 05 n	5.56
01	08	880814	18.52	70	22	05	02	302	11 07 n	1.23
01	09	880814	18.52	70	22	05	02	302	11 07 n	2.47
01	10	880814	18.52	70	22	05	02	302	11 07 n	4.94
01	11	880814	18.52	22	05	70	5	302	11 12 n	23.15
01	12	880814	18.52	05	70	22	5	299	11 12 n	1.85
01	01	880815	18.52	68	51	38	05	299	12 22 n	7.72
02	01	880815	18.52	22	70	05	03	299	12 25 n	13.89
02	02	880815	18.52	70	05	22	05	299	12 28 n	1.85
02	03	880815	18.52	70	05	22	04	299	12 37 w	4.94
02	04	880815	18.52	70	05	22	04	299	12 30 n	6.48
02	05	880815	18.52	05	22	70	05	299	12 30 n	9.26
02	06	880815	18.52	05	22	70	05	299	12 36 n	4.01
02	07	880815	18.52	38	68	51	05	299	12 36 n	13.89
02	08	880815	18.52	51	38	68	05	299	12 36 n	7.72
02	09	880815	18.52	51	38	68	05	299	12 42 n	2.16
02	10	880815	18.52	51	38	68	05	324	12 42 n	1.85
02	11	880815	18.52	51	38	68	05	299	12 43 n	2.16
02	12	880815	18.52	68	51	38	05	299	12 43 n	13.89
03	01	880815	18.52	22	70	05	01	299	12 59 n	6.79
03	02	880815	18.52	22	70	05	01	299	12 59 n	12.35
03	03	880815	18.52	38	68	51	01	299	13 05 n	7.72
03	04	880815	18.52	51	38	68	01	299	13 07 n	3.40
03	05	880815	18.52	51	38	68	01	320	13 07 n	2.78
04	01	880815	18.52	22	05	70	11	02	4	7.72
04	02	880815	18.52	22	05	70	11	02	4	9.88
04	03	880815	18.52	05	70	22	10	02	4	8.64
04	04	880815	18.52	70	22	05	10	02	4	8.03
04	05	880815	18.52	51	38	68	11	03	4	5.86
05	02	880815	18.52	51	38	68	11	03	4	5.25
05	03	880816	18.52	22	70	05	06	03	3	4.32
01	04	880816	18.52	70	05	22	07	03	3	9.26
01	05	880816	18.52	38	68	51	07	03	3	4.63
01	06	880816	18.52	38	68	51	07	03	3	3.09
01	07	880816	18.52	51	38	68	02	245	13 27 n	10.80
01	08	880816	18.52	68	51	38	02	245	13 31 n	0.62
02	01	880816	18.52	22	70	05	05	245	13 16 n	1.54
03	02	880816	18.52	70	05	22	02	245	13 11 n	7.10
03	03	880816	18.52	70	05	22	02	245	13 10 n	3.40

Table 2. (continued)

series	leg	date	speed km/hr	observer codes			sun position horz. vert.	beauf. no.	course (deg.)	position latitude longitude	km in leg
				left	right	rec.					
03	03	880816	18.52	70	05	22	2	245	13 08 n	129 51 w	3.70
03	04	880816	18.52	05	22	70	07	01	2	245	1.85
03	05	880816	18.52	05	22	70	05	01	2	245	4.94
03	06	880816	18.52	38	68	51	2	245	11.42	11.42	
03	07	880816	18.52	51	38	68	2	245	4.63	4.63	
03	08	880816	18.52	51	38	68	2	245	8.64	8.64	
03	09	880816	18.52	68	51	38	2	245	7.10	7.10	
04	01	880816	18.52	68	51	38	2	245	1.23	1.23	
04	02	880816	18.52	22	70	05	2	245	2.47	2.47	
05	01	880816	18.52	70	05	22	2	245	1.85	1.85	
06	01	880816	18.52	05	22	70	01	01	2	245	4.32
07	01	880816	18.52	05	22	70	01	01	2	245	0.93
08	01	880816	18.52	05	22	70	01	01	2	245	0.93
09	01	880816	18.52	51	38	68	2	230	4.01	4.01	
10	01	880816	18.52	68	51	38	2	230	6.48	6.48	
10	02	880816	18.52	38	68	51	2	230	6.48	6.48	
10	03	880816	18.52	22	70	05	10	02	2	330	9.26
10	04	880816	18.52	70	05	22	10	02	2	330	5.56
10	05	880816	18.52	70	05	22	10	03	2	330	3.70
10	06	880816	18.52	05	22	70	02	02	2	330	0.31
11	01	880816	18.52	05	22	70	02	02	2	336	0.31
01	01	880817	18.52	68	38	51	3	226	1.54	1.54	
02	01	880817	18.52	22	70	05	3	226	1.54	1.54	
02	02	880817	18.52	22	70	05	4	175	6.17	6.17	
02	03	880817	18.52	70	05	22	4	175	3.40	3.40	
03	01	880817	18.52	70	05	22	09	02	5	175	1.85
03	02	880817	18.52	05	22	70	09	02	5	175	3.70
03	03	880817	18.52	05	22	70	09	02	5	223	7.72
03	04	880817	18.52	51	68	38	08	02	5	223	1.54
03	05	880817	18.52	38	51	68	02	02	5	190	12.96
03	06	880817	18.52	68	38	51	07	01	5	250	15.12
03	07	880817	18.52	68	38	51	06	01	5	260	1.85
03	08	880817	18.52	22	70	05	06	01	5	260	10.80
03	09	880817	18.52	70	05	22	12	12	5	260	12.96
03	10	880817	18.52	70	05	22	12	12	5	190	1.23
04	01	880817	18.52	05	22	70	12	12	5	190	9.57
04	02	880817	18.52	05	22	70	12	12	5	190	11.11
04	03	880817	18.52	51	38	68	12	12	5	190	0.93
04	04	880817	18.52	51	38	68	12	12	5	190	4.63
04	05	880817	18.52	68	51	38	12	01	5	260	7.31
05	01	880817	18.52	68	51	38	12	01	5	260	0.31
05	02	880817	18.52	68	51	38	12	01	5	190	1.85
05	03	880817	18.52	38	68	51	02	01	5	260	6.79
05	04	880817	18.52	22	70	05	03	01	5	190	7.10
05	05	880817	18.52	22	70	05	03	01	5	190	5.25
05	06	880817	18.52	22	70	05	01	02	4	260	0.93
05	07	880817	18.52	22	70	05	01	02	4	240	3.09
05	08	880817	18.52	70	05	22	05	02	3	240	1.54
06	01	880817	18.52	51	68	38	08	02	3	240	10.80
06	02	880817	18.52	38	51	68	01	03	3	255	8.64
06	03	880817	18.52	38	51	68	01	03	3	255	7.72
06	04	880817	18.52	68	38	51	02	02	2	255	9.57
06	05	880817	18.52	22	70	05	01	02	2	255	0.31

Table 2. (continued)

series	leg	date	speed km/hr	observer left right rec.	observer codes		sun position horz. vert. no.	beauf. (deg.)	course latidue longitude in leg	position km in leg
					05	05				
01	01	880818	18.52	22	70	05	2	224	11 37 n	133 47 w
02	01	880818	18.52	68	51	38	1	250	11 33 n	133 54 w
03	01	880818	18.52	38	68	51	07	220	11 27 n	134 02 w
03	02	880818	18.52	51	38	68	07	220	11 22 n	134 07 w
03	03	880818	18.52	70	05	22	08	220	11 21 n	134 16 w
04	01	880818	18.52	05	22	70	08	220	11 16 n	134 27 w
04	02	880818	18.52	22	70	05	08	220	11 16 n	134 27 w
04	03	880818	18.52	51	38	68	08	220	11 16 n	134 27 w
05	01	880818	18.52	68	51	38	12	220	11 16 n	134 27 w
05	02	880818	18.52	38	68	51	12	220	11 16 n	134 27 w
05	03	880818	18.52	88	51	38	12	220	11 16 n	134 27 w
05	04	880818	18.52	38	68	51	12	220	11 16 n	134 27 w
06	01	880818	18.52	70	05	22	12	220	11 06 n	134 37 w
06	02	880818	18.52	70	05	22	12	220	11 06 n	134 37 w
06	03	880818	18.52	05	22	70	02	220	10 59 n	134 44 w
07	01	880818	18.52	05	22	70	02	220	10 59 n	134 44 w
07	02	880818	18.52	22	70	05	02	220	10 50 n	134 53 w
07	03	880818	18.52	38	68	51	02	220	10 37 n	135 03 w
08	01	880818	18.52	51	38	68	02	220	10 37 n	135 03 w
08	02	880818	18.52	51	38	68	02	220	10 37 n	135 03 w
08	03	880818	18.52	51	38	68	02	220	10 37 n	135 03 w
08	04	880818	18.52	68	51	38	02	220	10 37 n	135 03 w
08	05	880818	18.52	68	51	38	02	220	10 37 n	135 03 w
09	01	880818	18.52	70	05	22	02	220	10 35 n	135 05 w
10	01	880818	18.52	70	05	22	02	220	10 35 n	135 05 w
01	01	880820	18.52	51	38	68	02	291	10 35 n	135 05 w
01	02	880820	18.52	51	38	68	02	291	10 35 n	135 05 w
01	01	880821	18.52	70	22	05	02	300	12 05 n	142 10 w
01	02	880821	18.52	38	68	51	02	300	12 05 n	142 10 w
01	01	880821	18.52	51	38	68	02	300	12 05 n	142 10 w
02	01	880821	16.67	51	68	38	02	300	12 12 n	142 22 w
03	01	880821	18.52	22	70	05	02	301	12 22 n	142 33 w
01	01	880822	18.52	22	70	05	02	340	11 18 n	143 13 w
01	02	880822	18.52	51	38	68	02	340	11 39 n	143 21 w
02	01	880822	18.52	51	38	68	02	340	11 42 n	143 22 w
02	02	880822	18.52	70	22	05	02	340	11 42 n	143 22 w
02	03	880822	18.52	22	70	05	02	340	11 42 n	143 22 w
02	04	880822	18.52	22	70	05	02	340	11 55 n	143 28 w
02	05	880822	18.52	05	70	22	05	340	11 55 n	143 28 w
02	06	880822	18.52	05	70	22	05	340	11 55 n	143 28 w
02	07	880822	18.52	68	51	38	01	340	12 27 n	143 42 w
02	08	880822	18.52	38	68	51	01	340	12 27 n	143 42 w
02	09	880822	18.52	51	38	68	01	340	12 27 n	143 42 w
02	10	880822	18.52	70	22	05	01	340	12 27 n	143 42 w
03	01	880822	18.52	22	70	05	01	340	12 27 n	143 42 w
03	02	880822	18.52	05	70	22	05	340	12 27 n	143 42 w
03	03	880822	18.52	38	68	51	01	340	12 27 n	143 42 w
03	04	880822	18.52	51	38	68	01	340	12 27 n	143 42 w
04	01	880822	18.52	68	51	38	01	340	12 27 n	143 42 w
05	01	880822	18.52	70	22	05	01	340	12 27 n	143 42 w
05	02	880822	18.52	70	22	05	01	340	12 27 n	143 42 w
05	03	880822	18.52	70	22	05	01	340	12 27 n	143 42 w
01	01	880823	18.52	38	68	51	05	301	14 07 n	145 43 w
01	02	880823	18.52	38	68	51	05	301	14 07 n	145 43 w

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes rec.	sun position horz. vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg		
01	03	880823	18.52	70	05	22	05	02	3	301	14 15 n	145 59 w	7.41	
01	04	880823	18.52	70	05	22	05	02	3	301	14 15 n	145 59 w	6.48	
01	05	880823	18.52	05	22	70	05	02	3	301	14 15 n	145 59 w	8.95	
01	06	880823	18.52	05	22	70	05	02	3	301	14 15 n	145 59 w	4.63	
01	07	880823	18.52	22	70	05	05	02	3	301	14 15 n	145 59 w	13.89	
01	08	880823	18.52	68	51	38	68	05	01	301	14 27 n	146 15 w	13.89	
01	09	880823	18.52	38	68	51	68	05	01	301	14 32 n	146 27 w	7.72	
01	10	880823	18.52	51	38	68	68	05	01	301	14 32 n	146 27 w	6.17	
01	11	880823	18.52	51	38	68	68	05	01	301	14 32 n	146 27 w	4.01	
01	12	880823	18.52	70	05	22	66	06	12	301	14 38 n	146 37 w	9.26	
01	13	880823	18.52	70	05	22	12	12	12	301	14 38 n	146 37 w	12.96	
01	14	880823	18.52	05	22	70	05	12	12	301	14 52 n	147 00 w	10.80	
01	15	880823	18.52	22	70	05	12	12	4	301	14 52 n	147 00 w	11.73	
02	01	880823	18.52	68	51	38	68	51	01	301	14 52 n	147 00 w	8.03	
02	02	880823	18.52	38	68	51	51	01	5	301	14 52 n	147 00 w	7.41	
03	01	880823	18.52	70	05	22	55	05	5	301	15 06 n	147 24 w	8.33	
03	02	880823	18.52	05	22	70	05	11	02	301	15 06 n	147 24 w	3.40	
03	03	880823	18.52	22	70	05	11	02	5	301	15 06 n	147 24 w	8.03	
03	04	880823	18.52	68	51	38	68	51	4	301	15 06 n	147 24 w	2.78	
03	05	880823	18.52	68	51	38	68	51	4	301	15 06 n	147 24 w	10.80	
03	06	880823	18.52	38	68	51	68	51	4	301	15 06 n	147 24 w	6.17	
03	07	880823	18.52	51	38	68	68	11	03	301	15 06 n	147 24 w	3.70	
03	08	880823	18.52	51	38	68	68	05	4	301	15 06 n	147 24 w	0.31	
03	09	880823	18.52	51	38	68	68	05	4	303	16 19 n	149 25 w	5.83	
01	01	880824	16.67	05	70	22	05	03	4	303	16 33 n	149 46 w	6.59	
01	02	880824	16.48	38	68	51	05	03	4	303	16 42 n	149 59 w	5.86	
01	03	880824	17.59	38	68	51	05	02	4	303	16 42 n	149 59 w	2.93	
01	04	880824	17.59	51	38	68	68	05	02	310	16 42 n	149 59 w	10.26	
01	05	880824	17.59	51	38	68	68	05	02	310	16 42 n	149 59 w	13.20	
01	06	880824	17.59	68	51	38	68	05	02	310	16 42 n	149 59 w	13.49	
01	07	880824	17.59	70	22	05	05	02	4	310	16 42 n	149 59 w	13.49	
01	08	880824	17.59	22	05	70	05	01	4	310	16 42 n	149 59 w	1.47	
01	09	880824	17.59	05	70	22	05	01	4	307	16 47 n	150 05 w	2.64	
01	10	880824	17.59	05	70	22	05	01	4	307	16 47 n	150 05 w	1.17	
01	11	880824	17.59	05	70	22	05	01	4	307	16 50 n	150 10 w	10.26	
02	01	880824	17.59	51	38	68	51	38	4	303	17 03 n	150 29 w	2.64	
02	02	880824	17.59	68	51	38	68	51	4	303	17 03 n	150 29 w	7.92	
02	03	880824	17.59	68	51	38	68	51	4	303	17 03 n	150 29 w	11.73	
02	04	880824	17.59	38	68	51	38	68	51	5	303	17 03 n	150 29 w	3.52
02	05	880824	17.59	22	05	70	05	05	5	303	17 10 n	150 39 w	4.98	
03	01	880824	17.59	22	05	70	05	05	2	303	17 10 n	150 39 w	6.03	
04	01	880824	17.22	38	68	51	38	68	3	303	17 13 n	150 43 w	1.15	
04	02	880824	17.22	38	68	51	38	68	3	303	17 13 n	150 43 w	6.60	
04	03	880824	17.22	51	38	68	51	38	3	303	17 13 n	150 43 w	10.62	
05	01	880824	17.22	70	05	22	70	05	3	303	17 27 n	151 06 w	6.60	
05	02	880824	17.22	05	22	70	05	05	3	303	17 27 n	151 06 w	0.29	
05	03	880824	17.22	22	70	05	22	70	05	3	303	17 27 n	151 06 w	2.78
01	01	880902	18.52	05	70	22	05	05	5	142	15 20 n	151 39 w	4.94	
01	02	880902	18.52	05	70	22	05	05	5	142	15 20 n	151 39 w	7.41	
01	03	880902	18.52	70	22	05	05	05	5	142	15 20 n	151 39 w	0.3	

Table 2. (continued)

series	leg	date	speed km/hr	observer left right	codes rec.	sun position horz. vert.	beauf. no.	course (deg.)	latitude longitude in leg	km in leg
01	04	880902	18.52	22	05	70	5	142	8.03	
01	05	880902	18.52	38	68	51	5	142	9.88	
01	06	880902	18.52	38	68	51	02	15 04 n	4.01	
01	07	880902	18.52	51	38	68	10	142	13.89	
01	08	880902	18.52	68	51	38	10	142	9.26	
01	09	880902	18.52	68	51	38	5	142	4.63	
01	10	880902	18.52	05	70	22	5	130	13.89	
01	11	880902	18.52	70	22	05	5	130	14.20	
01	12	880902	18.52	22	05	70	5	130	1.85	
01	13	880902	18.52	22	05	70	12	14 43 n	11.73	
01	14	880902	18.52	38	68	51	12	5	4.32	
01	15	880902	18.52	38	68	51	12	6	6.48	
01	16	880902	18.52	51	38	68	12	6	13.89	
01	17	880902	18.52	68	51	38	12	12	9.88	
02	01	880902	18.52	68	51	38	05	02	8.03	
02	02	880902	18.52	38	68	51	05	02	7.72	
02	03	880902	18.52	51	38	68	5	130		
02	04	880902	18.52	70	05	22	5	130	2.78	
02	05	880902	18.52	70	05	22	4	130	3.70	
02	06	880902	18.52	05	22	70	05	03	6.17	
02	07	880902	18.52	22	70	05	05	03	4.32	
02	08	880902	18.52	22	70	05	4	130	0.31	
01	01	880903	18.52	51	38	68	4	150	3.40	
02	01	880903	18.52	51	38	68	5	150	3.70	
02	02	880903	18.52	68	51	38	5	150	4.94	
02	03	880903	18.52	68	51	38	5	150	4.01	
02	04	880903	18.52	38	68	51	5	150	3.40	
02	05	880903	18.52	38	68	51	4	150	4.32	
02	06	880903	18.52	70	22	05	5	150		
02	07	880903	18.52	70	22	05	4	150	7.72	
02	08	880903	18.52	22	05	70	4	150	6.17	
02	09	880903	18.52	22	05	70	10	02	8.03	
02	10	880903	18.52	05	70	22	10	02	4.01	
02	11	880903	18.52	05	70	22	10	01	9.26	
02	12	880903	18.52	68	51	38	11	01	13.89	
02	13	880903	18.52	38	68	51	11	01	13.89	
02	14	880903	18.52	51	38	68	4	150		
02	15	880903	18.52	51	38	68	4	142	6.17	
03	01	880903	18.52	05	70	22	4	142	3.40	
04	01	880903	18.52	05	70	22	4	142	3.70	
05	01	880903	18.52	51	38	68	5	142	1.23	
05	02	880903	18.52	68	38	99	04	02	8.33	
05	03	880903	18.52	68	51	38	4	142	2.78	
05	04	880903	18.52	68	38	51	4	142	4.94	
06	01	880903	18.52	38	68	51	3	142	5.25	
01	01	880904	18.52	22	05	10	03	6	6.79	
01	02	880904	18.52	70	05	22	10	03	9.26	
02	01	880904	18.52	38	68	51	10	03	2.78	
03	01	880904	18.52	38	68	51	3	137	0.31	
04	01	880904	18.52	51	38	68	11	01	9.26	
04	02	880904	18.52	22	05	70	11	01	3.70	
04	03	880904	18.52	22	05	70	11	01	10.49	

Table 2. (continued)

series	leg	date	speed km/hr	observer codes			sun position horz. vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg	
				left	right	rec.							
04	04	880904	18.52	05	70	22	11	01	2	137	09 34 n	146 37 w	13.58
04	05	880904	18.52	70	22	05	11	01	2	137	09 34 n	146 37 w	13.89
04	06	880904	18.52	51	38	68	12	12	2	137	09 34 n	146 37 w	12.35
04	07	880904	18.52	68	51	38	12	12	3	137	09 34 n	146 37 w	12.35
04	08	880904	18.52	38	68	51	04	01	3	137	09 34 n	146 37 w	4.63
04	09	880904	18.52	38	68	51	04	01	2	137	09 34 n	146 37 w	8.95
04	10	880904	18.52	22	05	70	04	01	2	137	09 34 n	146 37 w	6.17
04	11	880904	18.52	22	05	70	04	01	2	137	09 34 n	146 37 w	4.94
04	12	880904	18.52	05	70	22	04	01	2	137	09 34 n	146 37 w	5.25
04	13	880904	18.52	05	70	22	04	01	2	137	09 34 n	146 37 w	5.56
05	01	880904	18.52	70	22	05	04	02	2	137	09 01 n	146 09 w	7.10
05	02	880904	18.52	38	68	51	04	02	2	137	09 01 n	146 09 w	2.78
05	03	880904	18.52	38	68	51	04	02	3	137	09 01 n	146 09 w	4.94
05	04	880904	18.52	51	38	68	04	02	2	137	09 01 n	146 09 w	6.79
06	01	880904	18.52	05	22	70	04	01	2	137	09 01 n	146 09 w	0.31
06	02	880904	18.52	05	22	70	04	02	2	137	09 01 n	146 09 w	12.04
06	03	880905	18.52	05	70	22	05	05	5	116	07 20 n	144 01 w	8.64
01	01	880905	18.52	70	22	05	05	05	5	116	07 17 n	143 54 w	12.04
02	02	880905	18.52	22	05	70	05	01	5	116	07 07 n	143 34 w	9.26
02	03	880905	18.52	68	51	38	05	01	5	123	07 12 n	143 42 w	4.01
02	04	880905	18.52	68	51	38	05	01	5	123	07 07 n	143 34 w	4.32
03	01	880905	18.52	38	68	51	38	68	5	123	07 07 n	143 34 w	9.88
03	02	880905	18.52	51	38	68	51	38	5	123	07 03 n	143 25 w	7.10
04	01	880905	18.52	05	70	22	05	02	5	123	07 03 n	143 25 w	7.41
04	02	880905	18.52	70	22	05	05	02	5	123	07 03 n	143 25 w	8.64
04	03	880905	18.52	22	05	70	05	02	4	123	07 03 n	143 25 w	8.03
04	04	880905	18.52	38	68	51	51	4	4	123	06 54 n	143 09 w	7.72
04	05	880905	18.52	38	68	51	51	4	4	123	06 08 n	141 38 w	0.31
01	01	880906	18.52	05	70	22	11	03	3	123	06 08 n	141 38 w	1.85
01	02	880906	18.52	05	70	22	11	03	3	123	06 08 n	141 38 w	2.78
01	03	880906	18.52	05	70	22	11	03	3	123	06 08 n	141 38 w	0.93
01	04	880906	18.52	05	70	22	11	03	3	123	06 08 n	141 38 w	4.63
01	05	880906	18.52	70	22	05	05	03	3	123	06 08 n	141 38 w	0.62
01	06	880906	18.52	22	05	70	05	02	5	123	06 08 n	141 38 w	2.47
02	01	880906	18.52	51	38	68	11	02	5	123	06 08 n	141 38 w	4.32
02	02	880906	18.52	51	38	68	11	02	5	123	06 08 n	141 38 w	12.66
03	01	880906	18.52	68	51	38	11	02	4	123	05 59 n	141 21 w	1.85
04	02	880906	18.52	68	51	38	11	02	4	123	05 57 n	141 22 w	3.40
04	03	880906	18.52	38	68	51	11	02	5	123	05 57 n	141 22 w	0.93
04	04	880906	18.52	05	70	22	11	01	6	123	05 57 n	141 22 w	1.85
04	05	880906	18.52	05	70	22	11	01	6	123	05 57 n	141 22 w	0.62
01	01	880907	18.52	51	38	68	11	02	5	123	05 57 n	141 22 w	8.95
01	02	880907	18.52	51	38	68	11	03	6	117	05 57 n	141 22 w	7.10
01	03	880907	18.52	68	51	38	11	03	6	117	04 49 n	138 20 w	0.31
01	04	880907	18.52	68	51	38	11	03	6	117	04 49 n	138 20 w	8.43
01	05	880907	19.45	38	68	51	06	02	5	091	05 07 n	133 25 w	1.85
01	06	880907	19.45	51	38	68	06	02	5	091	05 07 n	133 25 w	8.95
01	01	880908	18.52	68	51	38	06	03	5	091	05 07 n	133 25 w	6.17
01	02	880908	18.52	68	51	38	06	03	5	091	05 07 n	133 25 w	3.09
01	03	880908	18.52	22	70	05	05	03	5	091	05 07 n	133 25 w	1.85
01	04	880908	18.52	68	51	38	05	04	4	074	05 29 n	131 43 w	0.64
01	01	880909	18.52	68	51	38	05	12	03	074	05 29 n	131 43 w	8.64
01	02	880909	18.52	68	51	38	05	12	03	074	05 29 n	131 43 w	0.64

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position	beauf. no.	course (deg.)	position latitude	longitude in leg
			left right rec.	horz. vert.					
01	03	880909	18.52	51	68	38	12	03	4
01	04	880909	18.52	51	68	38	12	03	074
01	05	880909	18.52	38	51	68	01	5	074
01	06	880909	18.52	70	22	05	01	02	5
01	07	880909	18.52	70	22	05	11	02	074
02	01	880909	18.52	70	22	05	11	02	5
02	02	880909	18.52	22	05	70	11	02	115
02	03	880909	18.52	22	05	70	02	02	115
02	04	880909	18.52	05	70	22	02	02	046
02	05	880909	18.52	05	70	22	02	01	046
02	06	880909	18.52	38	51	68	01	01	046
02	07	880909	18.52	68	38	51	02	01	046
02	08	880909	18.52	68	38	51	02	12	4
02	09	880909	18.52	51	68	38	12	12	4
03	01	880909	18.52	70	22	05	12	12	4
03	02	880909	18.52	22	05	70	12	12	3
03	03	880909	14.82	22	05	70	07	01	046
03	04	880909	13.89	05	70	22	07	01	3
03	05	880909	15.74	05	70	22	07	01	046
03	06	880909	15.74	38	68	51	07	01	3
03	07	880909	18.52	51	38	68	08	02	046
04	01	880909	18.52	51	38	68	08	02	3
04	02	880909	18.52	68	51	38	08	02	046
05	01	880909	18.52	22	70	05	08	03	3
05	02	880909	18.52	70	05	22	08	03	046
05	03	880909	18.52	38	68	51	08	03	3
05	04	880909	18.52	38	68	51	08	03	046
05	05	880910	18.52	22	70	05	02	03	1
05	06	880910	18.52	70	05	22	02	03	046
01	01	880910	18.52	70	05	22	01	02	1
01	02	880910	18.52	70	05	22	01	02	035
02	01	880910	18.52	70	05	22	01	02	1
02	02	880910	18.52	38	68	51	11	02	122
02	03	880910	18.52	51	38	68	11	02	1
02	04	880910	18.52	51	38	68	11	02	122
03	01	880910	18.52	68	51	38	11	01	122
04	01	880910	18.52	68	51	38	11	01	122
05	01	880910	18.52	22	70	05	11	01	132
06	01	880910	18.52	70	05	22	11	01	132
06	02	880910	18.52	70	05	22	12	12	132
07	01	880910	18.52	05	22	70	12	12	07
07	02	880910	18.52	51	68	38	12	12	45
08	01	880910	18.52	38	51	68	04	01	07
09	01	880910	18.52	22	70	05	22	02	132
10	01	880910	18.52	22	70	05	22	02	132
11	01	880910	18.52	51	68	38	11	02	132
11	02	880910	18.52	38	68	51	11	03	132
11	03	880910	18.52	70	05	22	11	03	132
11	04	880910	18.52	70	05	22	12	05	132
11	05	880911	18.52	38	68	51	11	02	132
01	02	880911	18.52	38	68	51	11	03	132
01	03	880911	18.52	51	68	38	11	03	132
01	04	880911	18.52	68	51	38	11	03	132
01	05	880911	18.52	70	22	05	11	02	132

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes	sun position horz. vert.	beauf. no.	course (deg.)	latitude	longitude	position in leg	km
01	06	880911	18.52	22	05	70	11	02	5	132			4.32
01	07	880911	18.52	22	05	70	11	02	5	132	05 35 n	125 51 w	0.93
01	08	880911	18.52	22	05	70	12	12	5	128	02 57 n	123 10 w	0.31
01	01	880912	18.52	22	05	70	12	12	5	128			5.25
01	02	880912	18.52	22	05	70	12	12	5	128			2.47
01	03	880912	18.52	21	38	68	12	12	5	128			12.35
01	04	880912	18.52	68	51	38	12	12	5	128	02 50 n	123 01 w	12.35
01	05	880912	18.52	38	68	51	02	02	5	128			13.58
01	06	880912	18.52	22	70	05	05	02	5	128			3.40
01	07	880912	18.52	22	70	05	06	01	5	086	02 46 n	122 55 w	7.72
01	08	880912	18.52	70	05	22	06	01	5	086			12.35
01	09	880912	18.52	05	22	70	06	01	5	086			12.96
01	10	880912	18.52	38	68	51	02	02	5	100			8.95
01	11	880912	18.52	51	68	38	06	02	5	100			8.95
01	12	880912	18.52	38	51	68	06	02	5	100			9.26
01	13	880912	18.52	22	70	05	22	02	5	100			6.79
01	14	880912	18.52	70	05	22	05	22	5	100			7.10
01	15	880912	18.52	70	05	22	05	22	5	100			0.31
01	01	880913	12.96	38	68	51	38	68	5	105	03 00 n	121 13 w	5.83
01	02	880913	12.96	51	38	68	51	38	5	105			6.48
01	03	880913	12.96	68	51	38	51	38	5	105			4.32
01	01	880914	18.52	22	70	05	22	05	5	085	04 13 n	118 39 w	4.94
02	02	880914	18.52	22	70	05	22	05	5	085	04 13 n	118 36 w	4.01
02	03	880914	18.52	05	22	70	05	22	5	085			9.26
02	04	880914	18.52	51	38	68	68	51	5	085			7.10
02	05	880914	18.52	51	38	68	68	51	5	085			12.35
02	06	880914	18.52	68	51	38	68	51	5	085			1.54
02	07	880914	18.52	68	51	38	68	51	5	085			3.09
03	01	880914	18.52	38	68	51	38	68	5	085			0.31
03	02	880914	18.52	22	70	05	22	05	5	085	04 17 n	118 15 w	7.10
03	03	880914	18.52	22	70	05	22	05	5	085	04 17 n	118 12 w	5.86
03	04	880914	18.52	70	05	22	05	22	5	085			8.03
03	05	880914	18.52	70	05	22	05	22	5	085			9.26
03	06	880914	18.52	70	05	22	05	22	5	085			4.94
03	07	880914	18.52	05	22	70	05	22	5	085			6.79
03	08	880914	18.52	38	68	51	38	68	5	085			6.79
04	01	880914	18.52	70	05	22	05	22	5	085			12.35
04	02	880914	18.52	22	70	05	22	05	5	085			11.73
04	03	880914	18.52	22	70	05	22	05	5	085			10.49
04	04	880914	18.52	70	05	22	05	22	5	085			3.40
04	05	880914	18.52	05	22	70	05	22	5	085			9.57
04	06	880914	18.52	68	51	38	68	51	5	085			12.35
04	07	880914	18.52	38	68	51	38	68	5	085			11.73
04	08	880914	18.52	51	38	68	68	51	5	085			10.49
04	09	880914	18.52	22	70	05	22	05	5	085			9.88
04	10	880914	18.52	22	70	05	22	05	5	085			8.03
04	01	880915	14.82	51	68	38	12	03	5	091	04 23 n	117 05 w	5.86
01	02	880915	14.82	51	68	38	11	03	5	110			2.47
01	03	880915	14.82	38	51	68	11	03	5	110			4.94
01	04	880915	14.82	38	51	68	11	03	5	110			3.46
02	01	880915	14.82	38	51	68	11	03	5	110	04 34 n	115 39 w	2.96
02	02	880915	14.82	68	51	38	51	68	5	110			6.67

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position left right rec.	horz. vert.	course no.	position beauf. no.	course (deg.)	latitude longitude	km in leg
02	03	880915	14.82	70	22	05	11	02	5	110	11.11
02	04	880915	14.82	22	05	70	11	02	5	110	11.85
02	05	880915	14.82	05	70	22	01	5	110	2.22	
02	06	880915	14.82	05	70	22	12	01	5	085	1.73
03	01	880915	14.82	60	38	51	12	01	5	085	10.62
03	02	880915	14.82	51	68	38	12	01	5	101	8.40
03	03	880915	14.82	51	68	38	12	12	5	095	0.99
03	04	880915	14.82	38	51	68	12	12	5	095	9.14
03	05	880915	14.82	70	22	05	12	12	5	095	10.62
03	06	880915	18.52	22	05	70	12	12	5	095	0.62
03	07	880915	14.82	22	05	70	12	12	5	095	1.73
03	08	880915	18.52	22	05	70	12	12	5	095	7.72
04	01	880915	18.52	05	70	22	05	12	5	095	9.57
04	02	880915	18.52	68	38	51	38	06	01	095	12.35
04	03	880915	18.52	38	68	51	06	01	5	105	10.19
04	04	880915	18.52	38	68	51	05	02	5	110	3.09
04	05	880915	18.52	51	38	68	68	05	02	090	11.42
04	06	880915	18.52	70	22	05	05	12	5	090	9.88
04	07	880915	18.52	22	05	70	05	05	5	090	9.57
04	08	880915	18.52	05	70	22	02	05	4	090	8.64
04	09	880915	18.52	68	38	51	38	05	4	090	3.09
04	01	880916	18.52	22	05	70	05	05	4	093	1.85
04	02	880916	18.52	22	05	70	05	05	4	180	3.70
04	03	880916	18.52	70	05	22	05	05	4	180	3.40
04	01	880916	18.52	51	38	68	12	02	4	090	5.25
04	03	880916	18.52	51	38	68	12	02	4	090	5.86
04	02	880916	18.52	68	51	38	12	02	4	090	13.27
04	01	880916	16.52	38	68	51	38	05	4	090	7.41
05	01	880916	18.52	05	22	70	05	05	4	086	5.25
05	02	880916	18.52	05	22	70	05	05	4	090	3.70
05	03	880916	18.52	22	05	70	05	22	4	090	9.57
05	04	880916	18.52	70	05	22	05	22	4	090	8.95
05	05	880916	18.52	38	68	51	38	05	4	090	12.04
05	06	880916	18.52	51	38	68	68	05	4	090	12.35
05	07	880916	18.52	68	51	38	38	05	4	090	6.17
05	08	880916	18.52	68	51	38	38	05	4	090	5.86
05	09	880916	18.52	05	22	70	05	22	4	090	8.33
07	01	880916	18.52	22	70	05	22	05	4	090	2.47
07	02	880916	18.52	70	05	22	05	22	4	090	2.47
08	01	880916	18.52	38	51	68	51	55	5	090	8.33
08	02	880916	18.52	68	38	51	38	51	5	101	7.72
08	03	880916	18.52	51	68	38	38	51	5	090	4.01
08	04	880916	18.52	05	22	70	05	22	5	090	6.48
08	05	880916	18.52	22	70	05	22	05	5	090	6.79
08	06	880916	18.52	70	05	22	05	22	5	101	3.70
01	01	880918	18.52	22	70	05	22	05	4	090	9.26
02	01	880918	18.52	70	05	22	05	22	4	101	3.40
03	01	880918	18.52	68	38	51	38	51	5	101	5.25
03	02	880918	18.52	68	38	51	38	51	5	101	7.41
04	01	880918	18.52	51	68	38	38	51	5	101	9.26
04	02	880918	18.52	38	51	68	68	38	5	101	9.26
04	03	880918	18.52	05	22	70	05	22	5	101	13.89

Table 2. (continued)

series	leg	date	speed km/hr	observer left	codes right	rec.	sun position horiz. vert.	beauf. no.	course (deg.)	position latitude longitude	km in leg
04	04	880918	18.52	22	70	05	5	101	04 14 n	106 14 w	14.20
	05	880918	18.52	70	05	22	5	101	04 14 n	106 14 w	13.58
04	06	880918	18.52	51	68	38	5	101	04 14 n	106 14 w	12.35
04	07	880918	18.52	38	51	68	5	101	04 14 n	106 14 w	12.70
04	08	880918	18.52	38	51	65	5	106	04 14 n	106 14 w	8.64
04	09	880918	18.52	68	38	51	5	106	04 14 n	106 14 w	12.66
04	10	880918	18.52	70	22	51	5	106	04 14 n	106 14 w	12.35
04	11	880918	18.52	22	70	05	5	106	04 14 n	106 14 w	7.72
01	01	880919	18.52	51	38	68	5	100	03 40 n	103 34 w	0.31
02	02	880919	18.52	68	51	38	5	102	03 42 n	103 26 w	5.25
01	01	880919	18.52	68	51	38	6	102	03 31 n	102 38 w	1.23
03	02	880919	18.52	70	22	05	5	102	03 30 n	102 29 w	8.33
03	03	880919	18.52	22	05	70	5	089	03 30 n	102 29 w	1.85
03	04	880919	18.52	22	05	70	5	069	03 30 n	102 29 w	2.47
03	05	880919	18.52	22	05	70	5	089	03 30 n	102 29 w	3.09
03	06	880919	18.52	38	68	51	4	089	03 36 n	102 15 w	4.94
04	01	880919	18.52	51	38	68	4	089	03 36 n	102 15 w	3.09
04	02	880919	18.52	05	70	22	4	089	03 36 n	102 15 w	8.95
04	03	880919	18.52	05	70	22	4	089	03 36 n	102 15 w	0.93
04	04	880919	18.52	70	22	05	5	089	03 36 n	102 15 w	9.26
04	05	880919	18.52	22	05	70	5	089	03 36 n	102 15 w	8.64
04	06	880919	18.52	68	38	51	5	089	03 36 n	102 15 w	9.26
04	07	880919	18.52	68	38	51	5	089	03 36 n	102 15 w	0.31
01	01	880920	18.52	05	70	22	4	090	03 35 n	100 16 w	5.25
01	02	880920	18.52	05	70	22	5	090	03 35 n	100 16 w	3.40
01	03	880920	18.52	70	22	05	5	090	03 35 n	100 16 w	0.93
02	01	880920	18.52	70	22	05	5	090	03 35 n	100 07 w	1.85
02	02	880920	18.52	22	05	70	5	090	03 35 n	100 07 w	6.48
02	03	880920	18.52	68	51	38	5	090	03 35 n	100 00 w	4.63
02	04	880920	18.52	68	51	38	5	090	03 35 n	100 00 w	11.11
02	05	880920	18.52	38	68	51	5	090	03 35 n	100 00 w	12.04
02	06	880920	18.52	51	38	68	5	090	03 35 n	100 00 w	13.89
01	01	880923	18.52	68	38	51	01	148	00 04 n	093 03 w	8.33
02	01	880923	18.52	51	68	38	12	148	00 00 s	093 01 w	9.88
02	02	880923	18.52	05	70	22	12	148	00 06 s	092 57 w	5.86
02	03	880923	18.52	05	70	22	12	148	00 06 s	092 57 w	0.31
03	01	880923	18.52	05	70	22	12	148	00 09 s	092 58 w	0.62
04	01	880923	18.52	70	22	05	12	148	00 13 s	092 57 w	2.16
05	01	880923	18.52	70	22	05	12	148	00 17 s	092 55 w	5.56
05	02	880923	18.52	22	05	70	12	148	00 25 s	092 49 w	2.47
06	01	880923	18.52	22	05	70	12	148	00 25 s	092 49 w	8.33
06	02	880923	18.52	51	38	68	01	148	00 25 s	092 49 w	2.78
07	01	880923	18.52	51	38	68	04	148	00 45 s	092 36 w	5.56
07	02	880923	18.52	68	51	38	04	148	01 05 s	088 46 w	4.94
07	03	880923	18.52	38	68	51	04	148	01 05 s	088 46 w	4.32
07	04	880923	18.52	05	70	22	04	148	01 05 s	088 46 w	3.09
07	05	880923	18.52	70	22	05	04	148	01 05 s	088 46 w	6.48
07	06	880923	18.52	22	05	70	04	148	01 05 s	088 46 w	5.86
08	01	880923	18.52	38	51	68	04	148	01 05 s	088 46 w	3.40
01	01	880926	18.52	22	05	70	05	148	01 05 s	088 46 w	5.56
01	02	880926	18.52	22	05	70	05	148	01 05 s	088 46 w	4.94
01	03	880926	18.52	70	22	05	01	148	01 05 s	088 46 w	4.32

Table 2. (continued)

series	leg	date	speed km/hr	observer left	codes right	sun position horz.	beauf. vert.	course no.	position (deg.)	latitude longitude	km in leg
01	04	880926	18.52	70	05	22	4	065	01 01 s	088 36 w	1.54
02	01	880926	18.52	51	22	70	4	065	01 00 s	088 33 w	0.62
03	01	880926	18.52	51	38	68	02	065	00 58 s	088 29 w	6.48
04	01	880926	18.52	68	51	38	4	065			7.10
04	02	880926	18.52	68	51	38	4	065			0.93
04	03	880926	18.52	68	51	38	02	065			3.40
04	04	880926	18.52	38	68	51	01	065			5.56
04	05	880926	18.52	38	68	51	02	065			4.94
04	06	880926	18.52	38	68	51	01	067	00 48 s	088 21 w	13.89
04	07	880926	18.52	22	70	05	01	067			6.17
04	08	880926	18.52	70	05	22	01	067			0.62
04	09	880926	18.52	70	05	22		067			4.32
05	01	880926	18.52	05	22	70		067	00 40 s	088 06 w	6.17
06	01	880926	18.52	05	22	70	55	067			12.35
06	02	880926	18.52	51	68	38	55	067			3.09
06	03	880926	18.52	38	51	68	55	078			10.19
06	04	880926	18.52	38	51	68	55	078			11.42
06	05	880926	18.52	68	38	51	55	078			12.66
06	06	880926	18.52	68	38	51	55	078			13.27
06	07	880926	18.52	70	05	22	55	078			11.11
06	08	880926	18.52	05	22	70	55	078			9.26
06	09	880926	18.52	68	38	51	55	078			9.26
06	10	880926	18.52	51	68	38	55	078			9.26
06	11	880926	18.52	38	51	68	55	078			9.26
06	12	880926	18.52	22	70	05	55	078			5.56
06	13	880926	18.52	22	70	05	55	078			0.31
01	01	880927	18.52	68	51	38	55	078	00 16 n	085 40 w	10.80
02	01	880927	18.52	22	70	05	55	078	00 17 n	085 31 w	13.27
02	02	880927	18.52	70	05	22	4	078			12.66
02	03	880927	18.52	05	22	70	55	078			12.66
02	04	880927	18.52	68	38	51	4	078			13.27
02	05	880927	18.52	51	68	38	4	078			13.89
02	06	880927	18.52	38	51	68	4	078	00 31 n	085 01 w	13.89
02	07	880927	18.52	22	70	05	22	3	078		12.35
02	08	880927	18.52	70	05	22	3	078			11.11
02	09	880927	18.52	05	22	70	3	078			9.57
03	01	880927	18.52	51	68	38	3	078			5.25
03	02	880927	18.52	38	51	68	3	078			3.70
03	03	880927	18.52	68	38	51	3	066			8.03
03	04	880927	18.52	22	70	05	22	3	078		8.03
03	05	880927	18.52	70	05	22	3	078			9.26
03	06	880927	18.52	05	22	70	3	078			7.10
03	07	880927	18.52	05	22	70	3	078			4.01
03	08	880927	18.52	38	51	68	3	066			6.17
03	09	880927	18.52	68	38	51	3	066	00 54 n	083 53 w	0.93
04	01	880927	18.52	68	38	51	3	066	00 55 n	083 49 w	2.78
04	02	880927	18.52	51	68	38	3	066	02 05 n	082 26 w	5.25
04	03	880927	18.52	51	68	38	3	066	02 07 n	082 23 w	0.31
01	01	880928	18.52	22	70	05	22	3	023		3.70
02	02	880928	18.52	68	38	51	4	023			4.01
02	03	880928	18.52	38	68	51	02	023			6.17

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes	sun position horiz. vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
02	04	880928	18.52	38	68	51	4	023	02 20 n	082 15 w	1.23	
03	01	880928	18.52	51	38	68	4	023	02 24 n	082 14 w	9.57	
04	01	880928	18.52	68	51	38	02	023	02 24 n	082 14 w	6.48	
04	02	880928	18.52	68	51	38	4	023	02 29 n	082 13 w	1.85	
04	03	880928	18.52	68	51	38	4	023	02 29 n	082 13 w	1.54	
04	04	880928	18.52	22	05	70	4	023	02 29 n	082 13 w	12.04	
04	05	880928	18.52	22	05	70	4	023	02 29 n	082 13 w	1.54	
04	06	880928	18.52	22	70	05	4	023	02 42 n	082 07 w	8.95	
04	07	880928	18.52	22	70	05	4	023	02 42 n	082 07 w	4.94	
04	08	880928	18.52	70	05	22	4	023	02 42 n	082 07 w	6.17	
04	09	880928	18.52	70	05	22	4	023	02 42 n	082 07 w	2.47	
04	10	880928	18.52	70	05	22	3	023	02 42 n	082 07 w	5.25	
04	11	880928	18.52	68	51	38	3	023	02 42 n	082 07 w	6.48	
04	12	880928	18.52	68	51	38	3	023	02 42 n	082 07 w	3.70	
04	13	880928	18.52	68	51	38	12	023	02 42 n	082 07 w	2.47	
04	14	880928	18.52	68	51	12	12	023	02 42 n	082 07 w	4.01	
04	15	880928	18.52	38	68	51	12	023	02 42 n	082 07 w	8.03	
04	16	880928	18.52	51	38	68	12	023	02 42 n	082 07 w	9.88	
05	01	880928	18.52	05	22	70	08	01	023	03 13 n	081 54 w	10.49
05	02	880928	18.52	22	70	08	4	023	03 13 n	081 54 w	9.57	
05	03	880928	18.52	20	05	22	08	02	023	03 13 n	081 54 w	9.88
05	04	880928	18.52	51	38	68	08	02	023	03 13 n	081 54 w	9.26
06	01	880928	18.52	68	51	38	08	02	023	03 35 n	081 43 w	6.79
06	02	880928	18.52	38	68	51	08	02	023	03 35 n	081 43 w	6.48
06	03	880928	18.52	05	22	70	05	09	010	04 01	04 01	4.94
06	04	880928	18.52	22	70	05	09	03	04	010	04 01	4.01
01	01	881005	18.52	64	69	31	02	02	010	05 19 n	080 05 w	4.01
01	02	881005	18.52	64	69	31	02	03	010	05 16 n	080 06 w	6.48
01	03	881005	18.52	69	64	64	02	03	010	05 16 n	080 06 w	1.54
02	01	881005	18.52	55	56	67	02	03	010	05 08 n	080 08 w	3.09
02	02	881005	18.52	55	56	67	02	03	010	05 07 n	080 09 w	1.23
02	03	881005	18.52	55	56	67	02	03	010	05 07 n	080 09 w	0.62
02	04	881005	18.52	55	56	67	4	010	05 05 n	080 09 w	0.31	
01	01	881006	18.52	67	55	56	5	010	04 08 n	080 22 w	6.79	
01	02	881006	18.52	67	55	56	5	010	04 04 n	080 23 w	3.70	
01	03	881006	18.52	55	56	67	5	010	04 02 n	080 23 w	2.16	
01	04	881006	18.52	55	56	67	5	010	04 02 n	080 23 w	7.41	
01	05	881006	18.52	69	31	64	09	01	03 45 n	080 26 w	11.73	
02	01	881006	18.52	31	64	69	09	01	03 43 n	080 27 w	5.56	
02	03	881006	18.52	31	64	69	09	01	03 43 n	080 27 w	3.40	
02	04	881006	18.52	64	69	31	09	01	03 43 n	080 27 w	10.49	
03	01	881006	17.59	69	31	64	02	02	0199	02 27 n	080 40 w	7.92
03	02	881006	17.59	67	55	56	02	03	0199	02 21 n	080 41 w	4.40
03	03	881006	17.59	67	55	56	02	03	0199	02 21 n	080 41 w	4.40
03	04	881006	17.59	55	56	67	02	03	0199	02 21 n	080 41 w	3.23
03	05	881006	17.59	55	56	67	02	03	0199	02 21 n	080 41 w	5.57
03	06	881006	17.59	55	56	67	4	0199	02 14 n	080 44 w	0.29	
01	01	881007	18.52	31	64	69	3	0199	01 28 n	081 00 w	0.93	
02	01	881007	18.52	64	69	31	4	0199	01 33 n	081 00 w	5.86	
03	01	881007	18.52	69	31	64	04	02	01 36 n	081 02 w	2.16	
03	02	881007	18.52	69	31	64	4	02	01 36 n	081 02 w	1.54	

Table 2. (continued)

series	leg	date	speed km/hr	left	right	observer codes	sun position	beauf. no.	course (deg.)	latitude	longitude	km in leg
03	03	881007	18.52	56	55	4	328	12.35	11.73	11.73	0.9	3.09
03	04	881007	18.52	67	55	4	328	11.73	0.9	0.9	3.09	3.09
04	01	881007	18.52	55	67	4	328	4.01	7.72	7.72	6.17	6.17
04	02	881007	18.52	55	67	01	328	0.93	0.93	0.93	8.95	8.95
04	03	881007	18.52	31	64	05	328	0.9	0.9	0.9	3.70	3.70
04	04	881007	18.52	31	64	05	328	11.73	11.73	11.73	6.17	6.17
04	05	881007	18.52	31	64	05	328	7.72	7.72	7.72	6.17	6.17
04	06	881007	18.52	64	69	31	315	0.95	0.95	0.95	3.70	3.70
04	07	881007	18.52	64	69	06	315	0.9	0.9	0.9	3.09	3.09
04	08	881007	18.52	64	69	01	315	3.09	3.09	3.09	3.09	3.09
04	09	881007	18.52	56	67	4	315	6.17	6.17	6.17	6.17	6.17
04	10	881007	18.52	56	67	55	323	2.78	2.78	2.78	2.78	2.78
04	11	881007	18.52	67	55	56	315	0.95	0.95	0.95	3.70	3.70
05	01	881007	18.52	67	55	56	323	0.9	0.9	0.9	3.09	3.09
05	02	881007	18.52	56	67	31	323	12.35	12.35	12.35	12.35	12.35
05	03	881007	18.52	31	64	64	323	3.09	3.09	3.09	3.09	3.09
05	04	881007	18.52	31	64	69	09	0.9	0.9	0.9	0.9	0.9
05	05	881007	18.52	31	64	69	09	0.9	0.9	0.9	0.9	0.9
05	06	881007	18.52	64	69	31	09	0.9	0.9	0.9	0.9	0.9
06	01	881007	18.52	69	31	64	09	0.9	0.9	0.9	0.9	0.9
06	02	881007	18.52	56	67	55	10	02	0.9	0.9	0.9	0.9
06	03	881007	18.52	67	55	56	10	02	0.9	0.9	0.9	0.9
06	04	881007	18.52	67	55	56	10	02	0.9	0.9	0.9	0.9
06	05	881007	18.52	67	55	56	10	02	0.9	0.9	0.9	0.9
06	06	881007	18.52	64	69	31	03	0.9	0.9	0.9	0.9	0.9
01	01	881008	18.52	55	56	67	4	328	9.88	9.88	9.88	4.01
01	02	881008	18.52	56	67	55	4	328	4.01	4.01	4.01	4.01
02	01	881008	18.52	64	69	31	4	328	13.58	13.58	13.58	13.58
02	02	881008	18.52	69	31	64	4	328	6.17	6.17	6.17	6.17
02	03	881008	18.52	69	31	64	4	328	2.47	2.47	2.47	2.47
02	04	881008	18.52	69	31	64	04	0.9	0.9	0.9	0.9	0.9
02	05	881008	18.52	31	64	69	4	328	9.26	9.26	9.26	9.26
02	06	881008	18.52	31	64	69	5	328	3.09	3.09	3.09	3.09
02	07	881008	18.52	55	56	67	04	0.9	0.9	0.9	0.9	0.9
02	08	881008	18.52	55	56	67	04	0.9	0.9	0.9	0.9	0.9
03	01	881008	18.52	55	67	55	4	328	12.35	12.35	12.35	12.35
03	02	881008	18.52	67	55	56	4	328	0.9	0.9	0.9	0.9
03	03	881008	18.52	64	69	31	4	328	12.35	12.35	12.35	12.35
03	04	881008	18.52	69	31	64	4	328	6.48	6.48	6.48	6.48
03	05	881008	16.67	69	31	64	5	320	5.28	5.28	5.28	5.28
03	06	881008	16.67	31	64	69	5	320	11.11	11.11	11.11	11.11
03	07	881008	16.67	55	67	56	5	320	7.50	7.50	7.50	7.50
03	08	881008	16.67	55	67	56	5	320	3.61	3.61	3.61	3.61
03	09	881008	16.67	56	67	55	5	320	1.39	1.39	1.39	1.39
03	10	881008	16.67	56	67	55	10	01	0.9	0.9	0.9	0.9
03	11	881008	16.67	56	67	55	5	320	2.22	2.22	2.22	2.22
03	12	881008	16.67	56	67	55	5	320	5.56	5.56	5.56	5.56
03	13	881008	16.67	67	55	56	5	273	11.39	11.39	11.39	11.39
03	14	881008	16.67	64	69	31	02	0.9	0.9	0.9	0.9	0.9
03	15	881008	16.67	69	31	64	11	02	0.9	0.9	0.9	0.9
03	16	881008	16.67	31	64	69	4	273	8.33	8.33	8.33	8.33
04	01	881008	16.67	31	64	69	4	273	2.22	2.22	2.22	2.22
04	02	881008	16.67	55	67	55	4	273	9.72	9.72	9.72	9.72

Table 2. (continued)

series	leg	date	speed km/hr	observer left right rec.	sun position horiz. vert.	beauf. no.	course (deg.)	position latitude longitude km in leg
04	02	881008	16.67	55	67	4	273	04 59 n 083 28 w 0.28
01	01	881009	18.52	69	64	5	234	04 10 n 084 43 w 10.19
02	02	881009	18.52	31	64	5	234	04 05 n 084 50 w 4.01
01	01	881009	18.52	31	69	5	234	04 02 n 084 52 w 1.85
03	01	881009	18.52	64	69	5	234	04 00 n 084 54 w 4.63
03	02	881009	18.52	67	55	5	234	04 00 n 084 54 w 12.35
03	03	881009	18.52	55	56	5	240	03 52 n 084 59 w 6.17
03	04	881009	18.52	55	67	5	240	03 52 n 084 59 w 12.35
03	05	881009	18.52	56	67	5	240	03 47 n 085 07 w 12.35
03	06	881009	18.52	69	31	5	240	03 47 n 085 07 w 12.35
03	07	881009	18.52	31	64	69	08	01
03	08	881009	18.52	31	64	69	31	08
03	09	881009	18.52	64	69	31	09	12
03	10	881009	18.52	64	69	31	09	12
03	11	881009	18.52	64	55	56	09	12
03	12	881009	18.52	67	55	56	12	12
03	13	881009	18.52	67	55	56	12	12
03	14	881009	18.52	55	56	67	5	348
03	15	881009	18.52	56	67	55	5	348
04	01	881009	18.52	56	67	55	08	01
04	02	881009	18.52	69	31	64	09	01
04	03	881009	18.52	31	64	69	09	01
04	04	881009	18.52	64	69	31	01	4
05	01	881009	18.52	64	69	31	01	4
05	02	881009	18.52	67	55	56	09	02
05	03	881009	18.52	55	56	67	09	02
06	01	881009	18.52	56	67	55	09	02
06	02	881009	18.52	56	67	55	09	02
06	03	881009	18.52	69	31	64	09	01
06	04	881009	18.52	69	31	64	09	01
06	05	881009	18.52	31	64	69	09	03
01	01	881010	16.67	56	67	55	4	348
01	02	881010	16.67	67	55	56	4	348
01	03	881010	16.67	67	55	56	4	348
01	04	881010	16.67	55	56	67	4	351
01	05	881010	16.67	55	56	67	4	351
01	06	881010	16.67	31	64	69	03	02
01	07	881010	16.67	31	64	69	03	02
01	08	881010	16.67	31	64	69	03	02
01	09	881010	16.67	31	64	69	03	02
01	10	881010	16.67	64	69	31	4	351
01	11	881010	16.67	69	31	64	4	351
01	12	881010	16.67	69	31	64	4	351
01	13	881010	16.67	69	31	64	4	351
01	14	881010	16.67	56	67	55	4	351
02	01	881010	18.52	67	55	56	4	340
03	01	881010	18.52	31	64	69	07	12
03	02	881010	18.52	31	64	69	07	12
03	03	881010	18.52	64	69	31	08	01
03	04	881010	18.52	56	67	55	4	340
03	05	881010	18.52	56	67	55	4	340
03	06	881010	18.52	56	67	55	01	01
03	07	881010	18.52	56	67	55	01	01

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left right rec.	sun position horz. vert.	beauf. no.	course (deg.)	position latitude longitude km in leg	
03	08	881010	18.52	67	55	5	212	07 00 n 086 15 w 6.17	
03	09	881010	18.52	67	55	5	212	07 00 n 086 15 w 6.31	
01	01	881013	18.52	64	69	3	239	01 57 n 090 51 w 6.17	
01	02	881013	18.52	64	69	2	239	01 54 n 090 56 w 4.01	
01	03	881013	18.52	69	31	2	239	01 50 n 091 02 w 1.23	
02	01	881013	18.52	55	56	2	239	01 50 n 091 02 w 11.11	
02	02	881013	18.52	56	67	2	239	01 55 n 091 02 w 0.93	
02	03	881013	18.52	56	67	2	262	01 50 n 091 09 w 2.16	
03	01	881013	18.52	56	67	2	255	01 49 n 091 11 w 5.56	
03	02	881013	18.52	67	55	2	255	01 48 n 091 16 w 2.78	
03	03	881013	18.52	67	55	3	255	01 46 n 091 25 w 2.78	
04	01	881013	18.52	64	69	3	259	01 46 n 091 25 w 10.80	
04	02	881013	18.52	69	31	3	259	01 46 n 091 25 w 9.26	
04	03	881013	18.52	31	64	3	259	01 46 n 091 25 w 2.47	
04	04	881013	18.52	31	64	3	265	01 43 n 091 42 w 6.79	
04	05	881013	18.52	55	56	3	265	01 43 n 091 42 w 7.72	
04	06	881013	18.52	55	67	4	265	01 43 n 091 42 w 4.63	
04	07	881013	18.52	56	67	4	265	01 43 n 091 42 w 12.35	
04	08	881013	18.52	67	55	4	265	01 41 n 092 02 w 12.47	
05	01	881013	18.52	64	69	5	227	01 41 n 092 02 w 5.25	
05	02	881013	18.52	64	69	4	227	01 41 n 092 02 w 1.85	
05	03	881013	18.52	64	69	4	230	01 24 n 092 12 w 5.86	
05	04	881013	18.52	69	31	4	230	01 24 n 092 12 w 9.26	
05	05	881013	18.52	55	67	01	02	01 33 n 092 12 w 9.26	
05	06	881013	18.52	56	67	4	230	01 24 n 092 12 w 9.26	
05	07	881013	18.52	67	55	56	4	230	01 24 n 092 12 w 9.57
05	08	881013	18.52	64	69	31	230	01 24 n 092 12 w 6.79	
05	09	881013	18.52	64	69	31	234	01 56 n 093 20 w 6.79	
05	10	881014	18.52	67	55	56	4	334	02 10 n 093 28 w 6.79
02	01	881014	18.52	69	31	4	334	02 18 n 093 34 w 2.78	
03	01	881014	18.52	67	55	56	04	331	02 21 n 093 35 w 2.78
04	01	881014	18.52	67	55	56	02	33 n 093 37 w 2.78	
05	01	881014	18.52	55	67	05	01	01 55 n 093 37 w 1.85	
05	02	881014	18.52	55	67	05	01	01 55 n 093 37 w 3.09	
05	03	881014	18.52	55	67	05	01	01 55 n 093 37 w 3.09	
05	04	881014	18.52	69	31	64	05	01 55 n 093 37 w 6.17	
05	05	881014	18.52	69	31	64	05	01 55 n 093 37 w 3.09	
05	06	881014	18.52	69	31	64	05	01 55 n 093 37 w 1.54	
06	01	881014	18.52	31	64	55	5	328	02 44 n 093 44 w 11.11
07	01	881014	18.52	31	64	55	5	328	02 44 n 093 44 w 2.78
07	02	881014	18.52	64	69	31	328	02 42 n 093 43 w 1.23	
08	01	881014	18.52	64	69	31	328	02 52 n 093 48 w 8.95	
08	02	881014	18.52	67	55	56	09	01 53 n 093 49 w 8.95	
08	03	881014	18.52	67	55	56	09	01 53 n 093 52 w 2.78	
08	04	881014	18.52	67	55	56	09	01 55 n 093 52 w 0.62	
08	05	881014	18.52	55	67	09	01	01 55 n 093 52 w 9.57	
08	06	881014	18.52	55	67	09	01	01 55 n 093 52 w 2.78	
08	07	881014	18.52	56	67	55	5	328	03 06 n 093 57 w 1.85
08	08	881014	18.52	56	67	55	5	328	03 06 n 093 57 w 0.62
09	01	881014	18.52	56	67	55	5	328	03 06 n 093 57 w 3.09
10	01	881014	18.52	31	64	69	10	02	03 12 n 094 02 w 1.23
10	02	881014	18.52	31	64	69	10	02	03 12 n 094 02 w 7.72
10	03	881014	18.52	64	69	31	4	328	03 17 n 094 05 w 2.16
10	04	881014	18.52	64	69	31	10	02	03 17 n 094 05 w 4.94

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position horz. vert.	beauf. no.	course (deg.)	latitude	longitude	position km in leg
10	05	881014	18.52	67	55	10	02	5	328	3.70
10	06	881014	18.52	67	55	10	03	5	328	1.85
10	07	881014	18.52	67	55	10	03	5	328	1.54
11	01	881014	18.52	55	67	31	01	02	328	2.78
11	02	881014	18.52	55	67	31	01	02	328	4.63
11	03	881014	18.52	56	67	31	01	02	328	7.72
11	04	881014	18.52	56	67	31	01	02	328	0.31
01	01	881015	18.52	31	64	69	4	235	04.01 n	4.94
01	02	881015	18.52	64	69	31	4	235	04.01 n	6.17
01	03	881015	18.52	64	69	31	08	03	235	04.01 n
01	04	881015	18.52	56	67	55	08	02	235	4.32
01	05	881015	18.52	56	67	55	08	02	235	5.25
01	06	881015	18.52	56	67	55	08	02	235	2.47
01	07	881015	18.52	56	67	55	08	02	235	2.47
02	01	881015	18.52	67	55	08	02	5	235	2.47
02	02	881015	18.52	67	55	08	02	5	235	2.47
02	03	881015	18.52	67	55	08	02	5	235	2.47
02	04	881015	18.52	67	55	08	02	5	235	2.47
02	05	881015	18.52	55	67	08	02	5	235	2.47
02	06	881015	18.52	55	67	08	01	5	235	2.47
03	01	881015	18.52	31	64	69	08	01	235	2.47
03	02	881015	18.52	31	64	69	08	01	235	2.47
03	03	881015	18.52	31	64	69	08	01	235	2.47
03	04	881015	18.52	31	64	69	08	01	235	2.47
03	05	881015	18.52	64	69	31	08	01	235	2.47
03	06	881015	18.52	64	69	31	08	01	235	2.47
03	07	881015	18.52	67	55	08	01	5	235	2.47
03	08	881015	18.52	67	55	09	01	5	235	2.47
04	01	881015	18.52	31	64	69	01	4	235	2.47
04	02	881015	18.52	64	69	31	12	01	235	2.47
05	01	881015	18.52	64	69	31	01	4	235	2.47
05	02	881015	18.52	56	67	55	01	4	235	2.47
05	03	881015	18.52	67	55	06	01	4	235	2.47
05	04	881015	18.52	55	67	55	06	01	235	2.47
05	05	881015	18.52	31	64	69	01	02	235	2.47
01	01	881016	20.37	55	67	01	02	4	229	01.03 n
01	02	881016	20.37	55	67	01	02	4	229	01.03 n
01	03	881016	20.37	55	67	01	02	4	229	01.03 n
01	04	881016	20.37	55	67	01	02	4	229	01.03 n
01	05	881016	20.37	64	69	31	01	02	229	01.03 n
01	06	881016	20.37	64	69	31	01	02	229	01.03 n
01	07	881016	20.37	31	64	69	01	02	229	01.03 n
02	01	881016	20.37	31	64	69	01	02	229	01.03 n
02	02	881016	20.37	55	67	01	02	4	229	01.03 n
02	03	881016	20.37	56	67	01	02	4	229	01.03 n
02	04	881016	20.37	56	67	01	02	4	229	01.03 n
02	05	881016	20.37	56	67	01	02	4	229	01.03 n
01	01	881017	18.52	31	64	69	01	02	229	01.03 n
02	01	881017	18.52	67	55	08	02	1	231	01.03 s
03	01	881017	18.52	67	55	08	02	1	231	01.03 s
03	02	881017	18.52	55	67	08	02	1	231	01.03 s
03	03	881017	18.52	55	67	08	02	1	231	01.03 s
04	01	881017	18.52	56	67	08	01	01	231	01.03 s

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes	sun position horz. vert.	position beauf. no.	course (deg.)	latitude longitude	position km in leg
05	01	881017	18.52	69	31	64	2	231	00 14 S	100 44 W	2.78
06	01	881017	18.52	31	64	69	2	231	00 20 S	100 47 W	9.26
06	02	881017	18.52	64	69	31	3	231	00 25 S	100 55 W	4.94
06	03	881017	18.52	64	69	09	12	231	00 25 S	101 03 W	2.78
06	04	881017	18.52	67	55	56	10	231	00 26 S	101 06 W	6.48
07	01	881017	18.52	55	56	67	12	01	01	01	3.09
08	01	881017	18.52	55	56	67	01	01	01	01	0.31
09	01	881017	18.52	55	56	67	01	01	01	01	2.16
09	02	881017	18.52	69	31	64	01	01	01	01	12.04
09	03	881017	18.52	31	64	69	01	01	01	01	12.66
09	04	881017	18.52	64	69	31	01	02	02	02	7.72
10	01	881017	18.52	67	55	56	01	02	02	02	5.86
10	02	881017	18.52	67	55	56	01	04	04	04	4.63
11	01	881017	18.52	55	56	67	55	01	03	03	0.62
01	01	881018	18.52	56	67	55	67	01	03	03	3.70
01	02	881018	18.52	56	67	55	08	03	03	03	0.93
01	03	881018	18.52	56	67	55	08	03	03	03	3.40
01	04	881018	18.52	67	55	56	01	03	03	03	8.64
01	05	881018	18.52	55	56	67	55	01	03	03	2.47
02	01	881018	18.52	55	56	67	55	01	03	03	2.16
02	02	881018	18.52	31	64	69	69	01	03	03	4.01
02	03	881018	18.52	31	64	69	69	01	03	03	8.33
02	04	881018	18.52	64	69	31	64	01	03	03	3.09
03	01	881018	18.52	69	31	64	31	01	03	03	1.23
04	01	881018	18.52	56	67	55	67	01	03	03	2.47
05	01	881018	18.52	56	67	55	67	01	03	03	9.26
05	02	881018	18.52	67	55	56	56	02	02	02	3.09
06	01	881018	18.52	55	56	67	55	01	02	02	1.54
06	02	881018	18.52	55	56	67	55	01	02	02	6.17
06	03	881018	18.52	55	56	67	55	01	02	02	1.54
07	01	881018	18.52	31	64	69	69	09	12	12	7.41
07	02	881018	18.52	31	64	69	69	09	12	12	10.80
07	03	881018	18.52	31	64	69	69	09	12	12	7.41
08	01	881018	18.52	56	67	55	67	01	01	01	3.09
09	01	881018	18.52	56	67	55	67	01	01	01	1.85
09	02	881018	18.52	67	55	56	67	01	01	01	1.85
09	03	881018	18.52	55	56	67	55	03	03	03	0.31
10	01	881018	18.52	31	64	69	69	01	01	01	11.73
11	01	881018	18.52	64	69	31	64	01	02	02	6.17
11	02	881018	18.52	64	69	31	64	03	03	03	1.54
12	01	881018	18.52	64	69	31	64	03	03	03	4.63
13	01	881018	18.52	56	67	55	67	03	03	03	12.96
13	02	881018	18.52	67	55	56	67	03	03	03	3.70
13	03	881018	18.52	67	55	56	67	12	02	02	1.85
14	01	881019	18.52	55	56	67	55	04	04	04	6.79
14	02	881019	18.52	56	67	55	67	04	04	04	0.31
14	03	881019	18.52	69	31	64	64	03	03	03	11.73
14	04	881019	18.52	55	56	67	55	12	02	02	7.72
14	05	881019	18.52	56	67	55	67	04	04	04	3.70
14	06	881019	18.52	69	31	64	64	04	04	04	1.85
14	07	881019	18.52	55	56	67	55	04	04	04	6.17
14	08	881019	18.52	67	55	56	67	04	04	04	0.31

Table 2. (continued)

series	leg	date	speed km/hr	observer left	right	codes	sun position horz. vert.	beauf. no.	course (deg.)	longitude position km in leg
02	09	881019	18.52	64	69	31	01	01	088	11.73
02	10	881019	18.52	69	31	64	01	01	088	12.35
02	11	881019	18.52	31	64	69	01	01	088	12.35
02	12	881019	18.52	55	56	67	01	01	088	6.48
02	13	881019	18.52	55	56	67	01	01	088	5.86
02	14	881019	18.52	56	67	55	01	01	088	7.72
02	15	881019	18.52	56	67	55	01	01	088	4.63
02	16	881019	18.52	67	55	56	01	01	088	12.66
02	17	881019	16.67	64	69	31	06	01	090	10.83
02	18	881019	16.67	69	31	64	05	01	090	11.11
02	19	881019	16.67	31	64	69	05	02	090	6.11
03	01	881019	16.67	31	64	69	05	02	090	1.39
03	02	881019	16.67	55	56	67	06	02	090	8.06
03	03	881019	16.67	56	67	55	07	02	060	4.44
03	04	881019	16.67	67	55	56	06	02	090	4.17
03	05	881019	16.67	67	55	56	06	02	090	8.33
03	06	881019	16.67	64	69	31	05	02	090	8.33
03	07	881019	16.67	69	31	64	05	03	090	6.94
01	01	881020	18.52	67	55	56	06	03	090	4.01
02	01	881020	18.52	67	55	56	06	03	090	2.78
02	02	881020	18.52	55	56	67	03	03	090	2.47
02	03	881020	18.52	55	56	67	03	03	090	6.48
03	01	881020	18.52	69	31	64	12	02	090	3.09
04	01	881020	18.52	31	64	69	12	02	090	8.64
04	02	881020	18.52	64	31	64	01	01	090	7.41
04	03	881020	18.52	67	55	56	01	01	090	5.25
04	04	881020	18.52	67	55	56	01	01	090	7.10
04	05	881020	18.52	55	56	67	01	01	090	4.63
05	01	881020	18.52	56	67	55	01	01	090	8.03
06	01	881020	17.59	69	31	64	12	04	090	10.26
07	01	881020	17.59	31	64	69	05	02	090	6.45
08	01	881020	17.59	67	55	56	06	01	091	2.93
09	01	881020	17.59	55	56	67	05	02	092	3.93
09	02	881020	17.59	55	56	67	05	02	092	3.52
09	03	881020	17.59	55	56	67	06	02	092	2.64
09	04	881020	17.59	55	56	67	04	02	092	1.17
09	05	881020	17.59	69	31	64	04	02	092	4.69
09	06	881020	17.59	69	31	64	05	02	092	5.57
09	07	881020	17.59	31	64	69	05	02	092	6.16
10	01	881020	17.59	67	55	56	06	03	092	7.62
10	02	881020	17.59	55	56	67	06	03	092	6.16
10	03	881020	17.59	55	56	67	06	03	092	0.29
01	01	881021	18.52	31	64	69	12	02	092	1.23
02	01	881021	18.52	64	69	31	02	03	095	5.56
02	02	881021	18.52	64	69	31	02	03	095	3.40
02	03	881021	18.52	69	31	64	02	03	095	5.86
02	04	881021	18.52	56	67	55	12	02	095	8.03
02	05	881021	18.52	56	67	55	12	02	095	0.93
02	06	881021	18.52	56	67	55	04	02	095	3.40
02	07	881021	18.52	67	55	56	03	02	095	1.23
03	01	881021	18.52	55	56	67	12	01	091	3.09
03	02	881021	18.52	55	56	67	12	01	091	4.94

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position	beauf. vert.	course no.	position (deg.)	latitude	longitude	km in leg
			left right	rec.	horz.	vert.					
03	03	881021	18.52	55	56	67	2	125	1.85		
03	04	881021	18.52	55	56	67	2	091	0.62		
03	05	881021	18.52	31	64	69	2	091	0.62		
04	01	881021	18.52	64	69	31	2	091	4.32		
04	02	881021	18.52	64	69	31	2	091	4.63		
04	03	881021	18.52	69	31	64	4	091	6.17		
05	01	881021	18.52	56	67	55	4	095	3.70		
05	02	881021	18.52	56	67	55	3	095	1.85		
06	01	881021	18.52	67	55	56	04	095	5.25		
06	02	881021	18.52	67	55	56	03	095	0.62		
07	01	881021	18.52	67	55	56	03	095	3.70		
07	02	881021	18.52	67	55	56	03	095	1.54		
08	01	881021	18.52	31	64	69	01	095	3.09		
09	01	881021	18.52	56	67	55	03	095	9.88		
09	02	881021	18.52	56	67	55	03	095	6.17		
09	03	881021	18.52	67	55	56	03	095	1.54		
10	01	881021	18.52	31	64	69	03	095	5.86		
01	01	881022	18.52	55	56	67	03	095	5.25		
01	02	881022	18.52	55	56	67	03	095	4.94		
01	03	881022	18.52	56	67	55	03	095	3.09		
01	04	881022	18.52	64	69	31	03	095	11.42		
02	01	881022	18.52	69	31	64	10	095	5.56		
03	01	881022	18.52	55	56	67	10	095	8.33		
03	02	881022	18.52	55	56	67	10	095	4.01		
03	03	881022	18.52	55	56	67	10	095	7.72		
03	04	881022	18.52	64	69	31	03	095	11.42		
04	01	881022	18.52	69	31	64	10	095	2.16		
04	02	881022	18.52	67	55	56	10	095	0.31		
05	01	881022	18.52	67	55	56	10	095	4.63		
05	02	881022	18.52	67	55	56	10	095	11.73		
05	03	881022	18.52	64	69	31	11	095	12.35		
05	04	881022	18.52	64	69	31	12	095	12.35		
05	05	881022	18.52	55	56	67	03	095	12.35		
05	06	881022	18.52	56	67	55	03	095	12.35		
05	07	881022	18.52	67	55	56	03	095	12.35		
05	08	881022	18.52	64	69	31	04	095	12.96		
05	09	881022	18.52	69	31	64	04	095	8.64		
05	10	881022	18.52	31	64	69	04	095	9.26		
05	11	881022	18.52	55	56	67	03	095	9.26		
05	12	881022	18.52	56	67	55	03	095	10.80		
05	13	881022	18.52	56	67	55	03	095	12.96		
05	14	881022	16.67	69	31	64	11	095	0.31		
01	01	881023	16.67	69	31	64	11	095	6.39		
01	02	881023	16.67	31	64	69	11	095	4.17		
01	03	881023	16.67	67	55	56	11	095	10.56		
01	04	881023	16.67	55	56	67	11	095	10.83		
01	05	881023	16.67	56	67	55	11	095	13.61		
02	01	881023	16.67	69	31	64	10	095	11.11		
02	02	881023	16.67	31	64	69	10	095	11.11		
02	03	881023	16.67	64	69	31	10	095	11.39		
02	04	881023	16.67	67	55	56	10	095	4.17		
03	01	881023	16.67	67	55	56	11	095	10.56		
03	02	881023	16.67	55	56	67	12	095	10.83		
03	03	881023	16.67	56	67	55	12	095	13.89		
03	04	881023	16.67	69	31	64	01	095	3.89		
03	05	881023	16.67	69	31	64	04	095	4.17		

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes rec.	sun position horz. vert.	beauf. no.	course (deg.)	position latitude longitude	km in leg
03	06	881023	16.67	31	64	69	04	01	4	143	1.67
03	07	881023	16.67	31	64	69	04	01	4	143	9.45
03	08	881023	16.67	64	69	31	04	01	4	143	7.50
04	01	881023	16.67	64	69	31	04	01	4	143	1.39
04	02	881023	16.67	67	55	56	04	02	4	143	8.33
04	03	881023	16.67	55	67	56	04	02	4	143	8.33
04	04	881023	16.67	56	67	55	04	02	4	143	8.33
04	05	881023	16.67	69	31	64	04	02	4	143	8.33
04	06	881023	16.67	31	64	69	04	02	4	143	7.50
04	07	881023	16.67	64	69	31	04	01	4	143	1.67
01	01	881024	14.82	56	67	55	01	03	03	093 54 w	6.91
01	02	881024	14.82	56	67	55	01	03	04	060	4.44
01	03	881024	14.82	67	56	56	01	03	04	060	8.33
01	04	881024	14.82	69	31	64	04	02	4	143	8.33
01	05	881024	14.82	31	64	69	04	02	4	143	8.33
01	06	881024	14.82	69	31	64	01	02	4	143	8.33
01	07	881024	14.82	56	67	55	01	02	4	143	8.33
01	08	881024	14.82	67	55	56	01	01	4	060	5.93
01	09	881024	14.82	67	55	56	01	01	4	060	9.88
02	01	881024	14.82	67	55	56	01	01	4	060	9.88
02	02	881024	14.82	55	67	56	01	01	4	060	9.88
02	03	881024	14.82	31	64	69	02	12	4	060	0.74
02	04	881024	14.82	31	64	69	01	01	4	060	2.22
03	01	881024	14.82	64	69	31	02	12	4	060	9.88
04	01	881024	14.82	64	69	31	02	12	4	060	4.94
05	01	881024	14.82	56	67	55	02	12	4	060	2.72
05	02	881024	14.82	56	67	55	02	12	4	080	1.48
05	03	881024	14.82	64	69	31	02	12	4	080	1.48
05	04	881024	14.82	64	69	31	02	12	4	080	0.99
05	05	881024	14.82	56	67	55	06	01	4	050	1.23
05	06	881024	14.82	56	67	55	07	01	4	050	1.48
05	07	881024	14.82	67	55	56	06	01	4	080	2.22
05	08	881024	14.82	55	67	55	06	01	4	080	2.22
05	09	881024	14.82	55	67	56	07	01	4	050	2.72
05	10	881024	14.82	55	67	56	06	02	4	080	6.42
05	11	881024	14.82	31	64	69	06	02	4	080	2.47
05	12	881024	14.82	64	69	31	09	02	4	340	4.94
05	13	881024	14.82	64	69	31	09	02	4	340	7.41
05	14	881024	14.82	69	31	64	09	02	4	340	3.70
05	15	881024	14.82	56	67	55	09	02	4	080	1.73
05	16	881024	14.82	56	67	55	06	02	5	080	0.25
05	17	881024	14.82	56	67	55	06	02	5	080	0.75
01	01	881025	18.52	64	69	31	09	02	4	050	4.01
01	02	881025	18.52	64	69	31	02	03	4	050	2.47
01	03	881025	18.52	64	69	31	02	03	4	050	4.01
01	04	881025	18.52	69	31	64	02	03	5	050	3.40
01	05	881025	18.52	69	31	64	02	03	5	050	3.09
01	06	881025	18.52	69	31	64	02	02	5	055	4.63
01	01	881026	18.52	55	67	56	03	02	5	055	8.64
01	02	881026	18.52	56	67	55	03	02	5	055	8.64
01	03	881026	18.52	67	55	56	03	03	5	055	5.56
01	04	881026	18.52	67	55	55	03	03	5	055	3.09

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes	sun position rec.	sun position horz.	beauf. course no.	(deg.)	latitude	longitude	km in leg
01	01	05	881026	18.52	69	31	64	64	3	055	03 50 s	087 58 w	0.31
02	02	01	881026	18.52	31	64	69	2	055	03 43 s	087 53 w	4.94	
03	01	881026	18.52	31	64	69	2	055	03 40 s	087 51 w	5.56		
03	02	881026	18.52	55	56	67	01	2	055	03 38 s	087 49 w	10.49	
03	03	881026	18.52	55	56	67	01	2	055	03 38 s	087 49 w	12.35	
03	04	881026	18.52	56	67	55	02	2	055	03 38 s	087 49 w	7.72	
03	05	881026	18.52	67	55	56	01	3	055	03 38 s	087 49 w	4.63	
03	06	881026	18.52	67	55	56	03	01	3	055	03 38 s	087 49 w	12.35
03	07	881026	18.52	69	31	64	03	01	3	055	03 26 s	087 35 w	12.35
03	08	881026	18.52	31	64	69	12	12	3	055	03 20 s	087 27 w	7.10
03	09	881026	18.52	31	64	69	3	3	055	03 20 s	087 27 w	3.70	
03	10	881026	18.52	31	64	69	12	12	3	055	03 18 s	087 24 w	1.85
03	11	881026	18.52	64	69	31	06	01	3	055	03 16 s	087 23 w	2.78
04	01	881026	18.52	64	69	31	06	01	3	055	03 14 s	087 20 w	4.94
04	02	881026	18.52	64	69	31	06	01	3	055	03 14 s	087 20 w	3.09
04	03	881026	18.52	55	56	67	2	060	03	11 s	087 17 w	9.88	9.88
04	04	881026	18.52	55	67	55	2	060	03	11 s	087 17 w	2.47	2.47
04	05	881026	18.52	56	67	55	06	01	2	060	03 06 s	087 13 w	1.54
05	01	881026	18.52	56	67	55	06	01	3	060	03 07 s	087 13 w	0.93
06	01	881026	18.52	67	55	56	07	02	2	060	03 07 s	087 13 w	1.85
07	01	881026	18.52	69	31	64	07	02	2	060	03 04 s	087 12 w	9.26
07	02	881026	18.52	31	64	69	07	02	2	060	03 02 s	087 08 w	1.23
08	01	881026	18.52	64	69	31	07	02	2	060	03 02 s	087 08 w	4.94
08	02	881026	18.52	64	69	31	07	02	2	060	03 00 s	087 04 w	1.54
08	03	881026	18.52	64	69	31	060	03 00 s	087 04 w	0.93	0.93	0.93	
08	04	881026	18.52	55	67	67	060	03 00 s	087 03 w	8.33	8.33	8.33	
09	01	881026	18.52	56	67	55	060	03 00 s	087 03 w	2.78	2.78	2.78	
09	02	881026	18.52	56	67	55	060	02	2	060	02 55 s	086 56 w	0.31
09	03	881026	18.52	31	64	69	10	03	2	149	02 51 s	085 28 w	9.88
09	04	881027	18.52	55	67	55	10	02	3	149	02 55 s	085 27 w	7.72
09	05	881027	18.52	64	69	31	10	01	3	149	03 02 s	085 29 w	2.16
09	06	881027	18.52	67	55	56	10	01	3	149	03 04 s	085 28 w	0.31
09	07	881027	18.52	67	55	67	10	02	3	149	03 06 s	085 29 w	4.32
09	08	881027	18.52	56	67	55	10	01	3	148	03 10 s	085 25 w	3.09
09	09	881027	18.52	31	64	69	11	01	3	148	03 16 s	085 20 w	11.11
10	01	881027	18.52	69	31	64	11	01	3	148	03 18 s	085 19 w	1.54
10	02	881027	18.52	55	56	67	12	12	3	148	03 22 s	085 17 w	6.17
10	03	881027	18.52	55	67	67	01	12	3	148	03 26 s	085 14 w	10.49
11	01	881027	18.52	67	55	67	03	01	4	148	03 36 s	085 06 w	12.04
12	01	881027	18.52	31	64	69	03	01	4	148	03 38 s	085 02 w	1.54
12	02	881027	18.52	64	69	31	03	01	4	148	03 38 s	085 02 w	5.56
13	01	881027	18.52	67	55	56	03	02	3	178	03 40 s	085 01 w	7.10
13	02	881027	18.52	55	56	67	03	02	3	168	03 40 s	085 01 w	0.62
13	03	881027	18.52	67	55	56	03	02	3	149	03 44 s	085 00 w	1.23
13	04	881027	18.52	67	55	56	03	02	3	149	03 46 s	084 58 w	4.63
13	05	881027	18.52	67	55	56	03	02	3	149	03 47 s	084 59 w	5.56
13	06	881028	18.52	55	56	67	03	02	3	149	03 47 s	084 59 w	3.70
13	07	881028	18.52	67	55	56	03	02	3	149	03 47 s	084 59 w	8.95
13	08	881028	18.52	67	55	56	03	02	3	140	05 05 s	084 13 w	4.63
13	09	881028	18.52	67	55	56	03	02	3	140	05 05 s	084 13 w	5.56
14	01	881028	18.52	67	55	56	03	02	3	140	05 08 s	084 10 w	10.49

Table 2. (continued)

series	leg	date	speed km/hr	observer codes			sun position horiz. vert.	beauf. no.	course (deg.)	latitude position	longitude position	km in leg	
				left	right	rec.							
01	04	881028	18.52	55	56	67	11	03	4	140	05 14 s	084 06 w	5.25
01	05	881028	18.52	55	56	67	11	02	4	140	05 16 s	084 04 w	4.94
01	06	881028	18.52	64	69	31	11	02	4	140	05 16 s	084 04 w	12.35
01	07	881028	18.52	69	31	64	11	02	4	140	05 30 s	083 52 w	12.35
01	08	881028	18.52	31	64	69	11	01	4	150	05 30 s	083 58 w	6.17
02	01	881028	18.52	31	64	69	11	01	4	150	05 30 s	083 58 w	1.54
02	02	881028	18.52	56	67	55	11	01	4	150	05 30 s	083 58 w	12.35
02	03	881028	18.52	67	55	56	11	01	4	150	05 47 s	083 42 w	12.35
02	04	881028	18.52	55	56	67	12	12	4	150	05 51 s	083 40 w	6.79
02	05	881028	18.52	55	56	67	11	01	4	150	05 54 s	083 39 w	1.85
02	06	881028	18.52	55	56	67	12	12	4	150	05 58 s	083 36 w	9.26
02	07	881028	18.52	64	69	31	02	12	4	150	06 00 s	083 35 w	4.63
02	08	881028	18.52	64	69	31	02	12	4	150	06 18 s	083 27 w	12.35
03	01	881028	18.52	69	31	64	02	02	4	150	06 22 s	083 22 w	3.09
04	01	881028	18.52	31	64	69	02	02	4	150	06 26 s	083 19 w	9.26
04	02	881028	18.52	31	64	69	02	02	4	150	06 31 s	083 16 w	8.64
04	03	881028	18.52	56	67	55	02	02	4	150	06 33 s	083 15 w	0.31
04	04	881028	18.52	67	55	56	04	01	4	150	06 07 s	083 31 w	0.62
04	05	881028	18.52	67	55	56	04	01	4	150	06 07 s	083 31 w	4.94
05	02	881028	18.52	55	56	67	04	02	4	150	06 15 s	083 27 w	12.35
05	03	881028	18.52	64	69	31	04	02	4	150	06 18 s	083 24 w	9.26
05	04	881028	18.52	64	69	31	04	02	4	150	06 22 s	083 22 w	3.09
05	05	881028	18.52	69	31	64	04	02	4	150	06 26 s	083 19 w	6.17
05	06	881028	18.52	31	64	69	04	02	4	150	06 31 s	083 16 w	8.03
05	07	881028	18.52	56	67	55	04	02	4	150	06 33 s	083 15 w	8.64
05	08	881028	18.52	67	55	56	04	02	4	150	07 52 s	082 31 w	0.31
05	09	881028	18.52	67	55	56	04	02	4	152	07 52 s	082 31 w	5.86
01	01	881029	18.52	69	31	64	04	02	4	148	07 52 s	082 31 w	4.94
01	02	881029	18.52	69	31	64	04	02	4	152	07 52 s	082 31 w	4.63
01	03	881029	18.52	31	64	69	04	02	4	152	07 52 s	082 31 w	8.33
01	04	881029	18.52	31	64	69	04	02	4	152	07 52 s	082 31 w	0.93
01	05	881029	18.52	64	69	31	04	02	4	147	08 05 s	082 23 w	12.35
01	06	881029	18.52	64	69	31	04	02	4	147	08 05 s	082 23 w	7.41
01	07	881029	18.52	55	56	67	04	02	4	147	08 27 s	082 15 w	5.25
01	08	881029	18.52	56	67	55	04	02	4	147	08 31 s	082 20 w	3.70
01	09	881029	18.52	56	67	55	04	02	4	147	08 31 s	082 20 w	1.23
02	01	881029	18.52	64	69	31	04	02	4	147	08 31 s	082 20 w	12.35
02	02	881029	18.52	67	55	56	04	02	4	147	08 31 s	082 20 w	7.41
02	03	881029	18.52	69	31	64	04	02	4	147	08 31 s	082 20 w	5.25
02	04	881029	18.52	31	64	69	04	02	4	147	08 31 s	082 20 w	3.70
02	05	881029	18.52	31	64	69	04	02	4	147	08 31 s	082 20 w	1.23
02	06	881029	18.52	55	56	67	04	02	4	147	08 31 s	082 20 w	12.35
03	01	881029	18.52	55	56	67	04	02	4	147	08 31 s	082 20 w	4.63
03	02	881029	18.52	55	56	67	04	02	4	147	08 31 s	082 20 w	5.86
04	01	881029	18.52	55	56	67	04	02	4	147	08 31 s	082 20 w	11.11
04	02	881029	18.52	56	67	55	04	02	4	147	08 31 s	082 20 w	8.03
05	01	881029	18.52	67	55	56	04	02	4	147	08 31 s	082 20 w	1.54
06	01	881029	18.52	67	55	56	04	02	4	147	08 31 s	082 20 w	12.35
06	02	881029	18.52	69	31	64	04	02	4	147	08 31 s	082 20 w	9.26
06	03	881029	18.52	31	64	69	04	02	4	147	08 31 s	082 20 w	3.40
06	04	881029	18.52	31	64	69	04	02	4	147	08 31 s	082 20 w	10.19
06	05	881029	18.52	64	69	31	04	02	4	147	08 31 s	082 20 w	6.17
07	01	881029	18.52	55	56	67	04	02	4	147	08 31 s	082 20 w	12.35

Table 2. (continued)

series	leg	date	speed km/hr	observer codes		sun position horz. vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
				left	right						
07	02	881029	18.52	55	56	67	4	238	238	238	1.54
07	03	881029	18.52	56	57	55	4	238	09 00	083 11	w 11.42
07	04	881029	18.52	57	55	64	01	03	4	238	1.70
07	05	881029	18.52	69	31	64	01	01	4	238	1.85
07	06	881029	18.52	69	31	64	01	01	4	236	2.78
01	01	881030	18.52	31	64	69	12	12	4	236	10.80
01	02	881030	18.52	64	69	31	12	12	4	236	5.86
01	03	881030	18.52	64	69	31	4	4	4	236	4.32
01	04	881030	18.52	69	31	64	01	01	4	236	4.63
01	05	881030	18.52	69	31	64	05	01	4	102	3.09
01	06	881030	18.52	69	31	64	05	01	4	102	2.16
01	07	881030	18.52	67	55	56	05	01	5	102	5.25
01	08	881030	18.52	67	55	56	05	01	5	099	2.16
01	09	881030	18.52	67	55	56	05	01	5	102	4.94
01	10	881030	18.52	55	56	67	05	01	5	102	0.62
02	01	881030	18.52	55	56	67	05	01	5	102	2.78
02	02	881030	18.52	55	56	67	05	01	5	102	0.31
01	01	881108	18.52	31	64	69	4	287	11 43	s 079 07	w 3.09
02	01	881108	18.52	31	64	69	4	287	11 43	s 079 07	w 8.03
02	02	881108	18.52	64	69	31	4	287	11 43	s 079 07	w 13.27
02	03	881108	18.52	69	31	64	4	287	11 38	s 079 23	w 8.03
03	01	881108	18.52	56	55	67	4	287	11 38	s 079 23	w 12.04
03	02	881108	18.52	55	67	56	4	287	11 35	s 079 33	w 4.32
03	03	881108	18.52	55	67	56	06	01	4	287	1.23
04	01	881108	18.52	55	67	56	06	01	4	287	4.32
04	02	881108	18.52	67	56	55	06	01	4	287	9.26
04	03	881108	18.52	67	56	55	06	01	4	287	3.09
04	04	881108	18.52	31	64	69	06	01	4	287	3.40
05	01	881108	18.52	69	31	64	12	12	4	287	9.26
05	02	881108	18.52	56	55	67	12	12	4	287	12.35
05	03	881108	18.52	55	67	56	12	12	4	287	6.17
05	04	881108	18.52	55	67	56	3	287	4	287	12.35
05	05	881108	18.52	55	67	55	4	287	4	287	1.23
05	06	881108	18.52	31	64	69	4	287	4	287	12.35
05	07	881108	18.52	64	31	64	4	287	4	287	12.35
05	08	881108	18.52	69	31	64	4	287	4	287	12.35
05	09	881108	18.52	56	55	67	4	287	11 16	s 080 33	w 9.26
05	10	881108	18.52	55	67	56	4	287	4	287	0.62
05	11	881108	18.52	55	67	56	11	02	4	287	1.23
05	12	881108	18.52	55	67	56	4	287	4	287	7.41
05	13	881108	18.52	67	56	55	4	287	11 13	s 080 42	w 1.54
06	01	881108	18.52	67	56	55	4	287	11 13	s 080 44	w 4.94
06	02	881108	18.52	31	64	69	4	287	11 12	s 080 47	w 13.89
06	03	881109	18.52	67	56	55	4	287	10 53	s 082 04	w 12.35
01	01	881109	18.52	56	55	67	4	287	4	287	5.56
01	02	881109	18.52	55	67	56	4	287	10 49	s 082 21	w 6.48
02	01	881109	18.52	64	69	31	4	287	10 48	s 082 26	w 13.27
03	01	881109	18.52	31	64	69	4	287	4	287	4.63
03	02	881109	18.52	31	64	69	3	287	3	287	7.72
03	03	881109	18.52	31	64	69	3	287	10 44	s 082 41	w 12.35
03	04	881109	18.52	67	56	55	06	01	3	287	7.72
03	05	881109	18.52	56	55	67	06	01	3	287	

Table 2. (continued)

series	leg	date	speed km/hr	left	right	observer codes	sun position horz. vert.	beauf. no.	course (deg.)	position latitude longitude in leg	km in leg
03	06	881109	18.52	56	55	67	56	3	287	4	4.94
03	07	881109	18.52	55	67	31	12	3	287	10 38 s	12.04
03	08	881109	18.52	64	69	31	64	3	287	10 38 s	12.35
03	09	881109	18.52	69	31	64	69	11	287	10 32 s	12.35
03	10	881109	18.52	31	64	69	55	11	287	10 32 s	12.35
03	11	881109	18.52	67	56	55	67	11	287	10 29 s	9.26
03	12	881109	18.52	56	55	67	69	11	287	10 29 s	2.16
04	01	881109	18.52	56	55	67	69	11	287	10 27 s	12.35
04	02	881109	18.52	55	67	56	69	31	287	10 27 s	1.85
04	03	881109	18.52	64	69	69	69	31	287	10 26 s	5.56
05	01	881109	18.52	64	69	31	64	3	287	10 26 s	1.85
05	02	881109	18.52	69	31	64	69	3	287	10 25 s	9.26
06	01	881109	18.52	31	64	69	69	31	287	10 23 s	8.03
06	02	881109	18.52	67	56	55	69	31	287	10 22 s	1.54
07	01	881109	18.52	56	55	67	69	31	287	09 53 s	10.80
01	02	881110	18.52	69	31	64	69	06	287	09 53 s	7.72
01	03	881110	18.52	31	64	69	69	06	287	09 53 s	3.09
01	04	881110	18.52	64	69	31	64	06	287	09 48 s	6.48
01	05	881110	18.52	64	69	31	64	06	287	09 48 s	4.32
01	06	881110	18.52	55	67	56	69	06	287	09 48 s	10.80
02	01	881110	18.52	67	56	55	69	01	289	09 39 s	0.62
03	01	881110	18.52	67	56	55	69	01	289	09 39 s	7.72
03	02	881110	18.52	69	31	64	69	4	289	09 35 s	9.26
03	03	881110	18.52	69	31	64	69	4	287	09 35 s	3.09
03	04	881110	18.52	31	64	69	69	4	287	09 35 s	8.03
04	01	881110	18.52	55	67	67	69	07	287	09 29 s	5.86
04	02	881110	18.52	55	67	56	69	08	287	09 29 s	3.70
04	03	881110	18.52	55	67	56	69	12	287	09 12 s	1.54
04	04	881110	18.52	55	67	56	69	09	287	09 12 s	2.47
04	05	881110	18.52	67	56	55	69	09	287	09 12 s	6.17
05	02	881110	18.52	56	55	67	69	31	287	09 21 s	12.35
05	03	881110	18.52	31	64	69	69	3	287	09 14 s	6.79
05	04	881110	18.52	31	64	69	69	11	287	09 14 s	5.56
05	05	881110	18.52	64	69	31	64	01	287	09 14 s	9.57
05	06	881110	18.52	64	69	31	64	01	287	09 14 s	2.78
05	07	881110	18.52	55	67	69	69	4	287	09 14 s	9.26
05	08	881110	18.52	67	56	55	69	4	287	09 14 s	4.32
05	09	881110	18.52	56	55	67	69	4	286	09 08 s	3.09
06	01	881110	18.52	69	31	64	69	4	286	09 10 s	1.23
07	01	881110	18.52	31	64	69	69	3	287	08 52 s	9.88
01	02	881111	18.52	56	55	67	56	3	287	08 51 s	1.85
02	01	881111	18.52	67	56	55	67	3	287	08 51 s	7.72
02	02	881111	18.52	31	64	69	69	3	287	08 50 s	12.35
02	03	881111	18.52	64	69	31	64	4	287	08 50 s	6.17
02	04	881111	18.52	64	69	31	64	4	289	08 47 s	9.26
03	01	881111	18.52	69	31	64	69	4	289	08 46 s	4.32
03	02	881111	18.52	56	55	67	69	01	289	08 44 s	12.35
03	03	881111	18.52	55	67	56	69	06	289	08 39 s	11.11
04	01	881111	18.52	67	56	55	69	01	289	08 39 s	11.42
04	02	881111	18.52	31	64	69	69	12	289	08 37 s	12.35

Table 2. (continued)

series	leg	date	speed km/hr	observer left	codes right	sun position horz. vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	03	881111	18.52	64	69	31	09	12	4	289	12.35
04	04	881111	18.52	69	31	64	10	01	4	289	12.35
04	05	881111	18.52	56	55	67	11	01	4	289	12.35
04	06	881111	18.52	55	56	56	11	01	4	289	8.95
04	07	881111	18.52	67	56	55	10	02	4	325	10.80
05	01	881111	18.52	31	64	69	10	02	4	325	8.33
05	02	881111	18.52	64	69	31	10	02	4	325	9.57
05	03	881111	18.52	56	55	67	10	02	4	325	0.62
05	04	881111	18.52	55	67	56	10	03	4	325	5.86
06	01	881111	18.52	55	67	56	10	03	4	325	3.40
06	02	881111	18.52	67	56	55	10	03	4	325	0.31
06	03	881111	18.52	67	56	55	10	03	4	287	6.17
01	01	881112	18.52	64	69	31	3	01	09	091 09	w
01	02	881112	18.52	64	69	31	4	01	09	089 22	w
01	03	881112	18.52	69	31	64	4	01	09	089	w
01	04	881112	18.52	67	56	55	4	01	09	089	w
01	05	881112	18.52	67	56	55	06	02	4	287	12.35
01	06	881112	18.52	56	55	67	06	02	4	287	8.33
01	07	881112	18.52	55	67	56	06	02	4	287	12.35
01	08	881112	18.52	64	69	31	01	01	4	287	7.10
02	01	881112	18.52	69	31	64	06	01	4	287	9.88
02	02	881112	18.52	31	64	69	06	01	4	287	12.35
02	03	881112	18.52	67	56	55	06	12	4	287	12.35
02	04	881112	18.52	56	55	67	06	12	4	287	4.63
02	05	881112	18.52	56	55	67	06	12	4	287	4.94
02	06	881112	18.52	56	55	67	06	12	4	287	2.78
02	07	881112	18.52	55	67	56	10	01	4	287	7.41
02	08	881112	18.52	55	67	56	10	01	4	287	2.78
02	09	881112	18.52	55	67	56	06	01	4	287	2.47
02	10	881112	18.52	64	69	31	01	01	4	287	3.09
03	01	881112	18.52	64	69	31	01	01	4	287	5.86
03	02	881112	18.52	64	69	31	11	01	4	287	1.85
03	03	881112	18.52	69	31	64	01	01	4	287	12.35
03	04	881112	18.52	31	64	69	01	01	4	287	3.40
03	05	881112	18.52	67	56	55	11	02	4	287	6.17
03	06	881112	18.52	67	56	55	11	02	4	287	8.95
03	07	881112	18.52	56	55	67	06	02	4	287	4.94
03	08	881112	18.52	55	67	56	11	03	4	285	9.88
04	01	881112	18.52	69	31	64	11	03	4	285	6.17
04	02	881112	18.52	31	64	69	11	03	4	284	2.78
01	01	881113	18.52	55	67	56	06	02	4	284	6.79
01	02	881113	18.52	67	56	55	06	02	4	284	7.10
01	03	881113	18.52	56	55	67	06	02	4	284	5.25
01	04	881113	18.52	56	55	67	06	02	4	284	1.85
01	05	881113	18.52	69	31	64	06	02	4	284	6.17
01	06	881113	18.52	69	31	64	06	02	4	284	7.41
01	07	881113	18.52	31	64	69	06	02	4	284	2.16
01	08	881113	18.52	31	64	69	06	02	4	286	4.63
01	09	881113	18.52	64	69	31	06	02	4	286	1.85
01	10	881113	18.52	64	69	31	06	02	4	286	4.63
01	11	881113	18.52	64	69	31	06	02	4	286	1.85
01	12	881113	18.52	55	67	56	06	02	4	286	4.63

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes rec.	sun position horiz. vert.	beauf. no.	course (deg.)	latitude position in leg
01	13	881113	18.52	55	67	56	06	01	4	289
01	14	881113	18.52	55	67	56	07	01	4	289
02	01	881113	18.52	67	56	07	07	01	4	284
02	02	881113	18.52	69	31	64	64	01	4	284
02	03	881113	18.52	31	64	69	31	05	5	284
02	04	881113	18.52	31	64	69	12	12	5	284
02	05	881113	18.52	64	69	31	12	12	5	284
03	01	881113	18.52	55	67	56	11	01	5	284
03	02	881113	18.52	55	67	56	11	01	5	284
03	03	881113	18.52	67	56	55	10	01	5	284
03	04	881113	18.52	67	56	55	10	01	5	284
03	05	881113	18.52	67	56	55	10	01	5	284
03	06	881113	18.52	56	55	67	10	01	5	284
03	07	881113	18.52	56	55	67	10	01	5	284
03	08	881113	18.52	56	55	67	10	02	5	284
03	09	881113	18.52	69	31	64	10	02	5	284
03	10	881113	18.52	69	31	64	10	02	5	284
03	11	881113	18.52	31	64	69	10	02	5	315
03	12	881113	18.52	64	69	31	10	02	5	315
03	13	881113	18.52	55	67	56	55	05	5	315
03	14	881113	18.52	55	67	56	55	05	5	315
03	15	881113	18.52	67	56	55	55	05	5	315
04	01	881113	18.52	67	56	55	55	05	5	280
04	02	881113	18.52	56	55	67	55	05	5	280
04	03	881113	18.52	56	55	67	55	05	5	280
04	04	881113	18.52	31	64	69	31	05	5	279
01	01	881114	18.52	31	64	69	31	04	4	279
01	02	881114	18.52	64	69	31	04	4	279	06
01	03	881114	18.52	56	55	67	55	04	4	279
02	01	881114	18.52	55	67	56	55	04	4	279
02	02	881114	18.52	67	56	55	55	04	4	279
03	01	881114	18.52	67	56	55	55	04	4	279
03	02	881114	18.52	31	64	69	55	04	4	279
03	03	881114	18.52	64	69	31	06	01	4	279
03	04	881114	18.52	64	69	31	06	01	4	279
03	05	881114	18.52	69	31	64	06	01	4	279
03	06	881114	18.52	56	55	67	06	01	4	279
03	07	881114	18.52	55	67	56	09	12	4	279
03	08	881114	18.52	55	67	56	09	12	4	279
03	09	881114	18.52	67	56	55	10	12	4	279
04	01	881114	18.52	31	64	69	44	44	4	279
04	02	881114	14.82	31	64	69	44	44	4	279
04	03	881114	14.82	64	69	31	11	01	4	279
04	04	881114	14.82	64	69	31	11	01	4	279
05	01	881114	14.82	64	69	31	11	01	5	279
05	02	881114	14.82	69	31	64	11	01	5	279
05	03	881114	18.52	69	31	64	11	01	5	279
06	01	881114	18.52	56	55	67	11	01	5	279
06	02	881114	18.52	55	67	56	11	02	5	279
07	01	881114	18.52	55	67	56	11	02	5	279
07	02	881114	18.52	55	67	56	11	02	5	279
07	03	881114	18.52	67	56	55	11	02	5	279
08	01	881114	18.52	67	56	55	11	02	5	279
08	02	881114	18.52	31	64	69	11	02	4	279
08	03	881114	18.52	64	69	31	11	02	4	279

Table 2. (continued)

series	leg	date	speed km/hr	left	right	observer codes	rec.	sun position horz. vert.	beauf. no.	course (deg.)	latitude longitude	position km in leg
09	01	881114	18.52	69	31	64	55	05 51 S	099	08 W	2.16	
01	01	881115	18.52	67	56	55	67	05 44 S	100	29 W	9.88	
01	02	881115	18.52	56	55	67	56	05 43 S	100	35 W	9.88	
01	03	881115	18.52	55	67	56	67	05 42 S	100	41 W	1.54	
01	04	881115	18.52	55	67	56	67	05 42 S	100	41 W	8.03	
01	05	881115	18.52	64	69	31	64	05 40 S	100	46 W	12.35	
01	06	881115	18.52	69	31	64	4	05 38 S	100	57 W	6.17	
02	01	881115	18.52	69	31	64	4	05 38 S	100	57 W	4.32	
02	02	881115	18.52	31	64	69	4	05 29 S	101	36 W	12.35	
03	01	881115	18.52	67	56	55	67	05 35 S	101	36 W	4.63	
04	01	881115	18.52	56	55	67	67	05 33 S	101	11 W	7.72	
04	02	881115	18.52	55	67	56	76	05 31 S	101	19 W	7.41	
04	03	881115	18.52	64	69	31	08	05 31 S	101	19 W	8.03	
04	04	881115	18.52	64	69	31	09	05 29 S	101	30 W	12.35	
04	05	881115	18.52	69	31	64	10	05 28 S	101	30 W	6.17	
04	06	881115	18.52	69	31	64	10	05 24 S	102	12 W	6.17	
04	07	881115	18.52	31	64	69	10	05 24 S	102	22 W	7.72	
04	08	881115	18.52	67	56	55	11	05 27 S	101	41 W	12.35	
04	09	881115	18.52	56	55	67	11	05 27 S	101	41 W	12.35	
04	10	881115	18.52	55	67	56	11	05 27 S	101	41 W	0.93	
04	11	881115	18.52	55	67	56	11	05 27 S	101	59 W	2.16	
05	01	881115	18.52	55	67	56	4	05 26 S	102	00 W	9.26	
05	02	881115	18.52	64	69	31	64	05 25 S	102	06 W	9.26	
05	03	881115	18.52	69	31	64	4	05 24 S	102	12 W	7.72	
05	04	881115	18.52	31	64	69	4	05 24 S	102	12 W	6.17	
05	05	881115	18.52	67	56	55	67	05 24 S	102	22 W	7.72	
06	01	881115	18.52	56	55	67	4	05 24 S	102	22 W	8.33	
06	02	881115	18.52	55	67	56	4	05 23 S	102	30 W	0.31	
06	03	881115	18.52	55	67	56	4	05 23 S	103	49 W	8.33	
01	01	881116	18.52	69	31	64	4	05 17 S	103	49 W	7.72	
01	02	881116	18.52	31	64	69	5	05 17 S	103	49 W	9.26	
01	03	881116	18.52	64	69	31	5	05 16 S	104	04 W	12.35	
01	04	881116	18.52	55	67	56	4	05 16 S	104	04 W	12.35	
01	05	881116	18.52	67	56	55	5	05 16 S	104	04 W	10.80	
02	01	881116	18.52	64	69	31	07	05 07 S	104	30 W	0.93	
02	02	881116	18.52	64	69	31	01	05 07 S	104	31 W	4.32	
02	03	881116	18.52	64	69	31	08	05 08 S	104	33 W	8.33	
02	04	881116	18.52	55	67	56	4	05 08 S	104	33 W	12.35	
02	05	881116	18.52	67	56	55	4	05 08 S	104	33 W	12.35	
02	06	881116	18.52	56	55	67	4	05 07 S	104	58 W	11.73	
02	07	881116	18.52	69	31	64	4	05 06 S	105	00 W	9.26	
02	08	881116	18.52	69	31	64	11	05 07 S	105	07 W	1.23	
02	09	881116	18.52	31	64	69	11	05 07 S	105	07 W	7.41	
03	01	881116	18.52	31	64	69	11	05 06 S	105	00 W	3.09	
03	02	881116	18.52	64	69	31	12	05 08 S	105	14 W	4.63	
03	03	881116	18.52	64	69	31	11	05 10 S	105	17 W	3.09	
03	04	881116	18.52	64	69	31	10	05 09 S	105	17 W	1.54	
03	05	881116	18.52	64	69	31	01	05 09 S	105	17 W	5.25	
03	06	881116	18.52	55	67	56	5	05 08 S	105	19 W	2.16	
03	07	881116	18.52	55	67	56	4	05 08 S	105	19 W	1.85	
03	08	881116	18.52	67	56	55	11	05 08 S	105	19 W	3.40	
03	09	881116	18.52	67	56	55	11	05 08 S	105	19 W	270	

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position horz. vert.	beauf. no.	course (deg.)	position latitude longitude km in leg
03	10	881116	18.52	67	56	11	02	290 05 08 s 105 26 w 5.86
03	11	881116	18.52	56	55	11	02	290 05 08 s 105 26 w 6.17
03	12	881116	18.52	56	55	67	5	290 05 08 s 105 26 w 3.09
03	13	881116	18.52	69	31	64	5	271 05 05 s 105 35 w 7.72
03	14	881116	18.52	31	64	69	5	271 05 05 s 105 35 w 3.09
03	15	881116	18.52	31	64	69	5	271 05 05 s 105 35 w 5.56
03	16	881116	18.52	64	69	31	5	271 05 05 s 105 35 w 4.94
03	17	881116	18.52	64	69	31	11	03 271 05 10 s 107 15 w 4.32
01	01	881117	18.52	56	55	67	5	273 05 10 s 107 15 w 6.17
01	02	881117	18.52	55	67	56	5	273 05 10 s 107 15 w 4.01
01	03	881117	18.52	55	67	56	4	276 05 10 s 107 20 w 2.16
01	04	881117	18.52	67	56	55	5	276 05 10 s 107 20 w 3.09
01	05	881117	18.52	67	56	55	5	276 05 10 s 107 25 w 3.09
01	06	881117	18.52	31	64	69	5	276 05 10 s 107 25 w 12.35
01	07	881117	18.52	64	69	31	5	276 05 10 s 107 25 w 11.11
02	01	881117	18.52	56	55	67	4	270 05 02 s 108 27 w 8.33
02	02	881117	18.52	55	67	56	4	270 05 02 s 108 27 w 8.03
03	01	881117	18.52	67	56	55	4	270 05 01 s 108 42 w 7.72
03	02	881117	18.52	31	64	69	4	270 05 01 s 108 42 w 1.54
03	03	881117	18.52	31	64	69	11	01 270 05 01 s 108 42 w 4.63
03	04	881117	18.52	31	64	69	4	270 05 01 s 108 42 w 3.09
03	05	881117	18.52	64	69	31	4	270 05 01 s 108 42 w 1.85
04	01	881117	18.52	69	31	64	4	270 05 03 s 108 50 w 3.70
04	02	881117	18.52	69	31	64	4	270 05 03 s 108 50 w 4.63
04	03	881117	18.52	56	55	67	11	02 270 05 03 s 108 56 w 9.57
04	04	881117	18.52	55	67	56	4	270 05 02 s 109 00 w 9.88
04	05	881117	18.52	67	56	55	4	270 05 02 s 109 06 w 2.47
05	01	881117	18.52	67	56	55	4	270 05 04 s 109 08 w 4.63
05	02	881117	18.52	67	56	55	4	270 05 04 s 109 12 w 0.31
01	01	881118	18.52	67	56	55	3	286 04 58 s 110 01 w 7.72
01	02	881118	18.52	56	55	67	3	286 04 58 s 110 01 w 7.72
01	03	881118	18.52	55	67	56	3	286 04 56 s 110 14 w 7.72
01	04	881118	18.52	64	69	31	3	286 04 56 s 110 14 w 12.35
02	01	881118	18.52	69	31	64	3	288 04 52 s 110 32 w 5.56
02	02	881118	18.52	67	56	55	3	288 04 52 s 110 32 w 10.80
02	03	881118	18.52	67	56	55	4	288 04 52 s 110 32 w 1.54
02	04	881118	18.52	56	55	67	4	288 04 52 s 110 32 w 5.25
02	05	881118	18.52	56	55	67	4	288 04 52 s 110 32 w 7.10
02	06	881118	18.52	55	67	56	5	308 04 49 s 110 45 w 7.10
03	01	881118	18.52	64	69	31	5	308 04 49 s 110 51 w 3.09
04	01	881118	18.52	69	31	64	5	288 04 43 s 110 54 w 5.56
05	01	881118	18.52	31	64	69	10	01 288 04 40 s 111 59 w 9.26
05	02	881118	18.52	67	56	55	4	288 04 40 s 111 59 w 6.17
05	03	881118	18.52	67	56	55	10	02 288 04 40 s 111 59 w 3.09
05	04	881118	18.52	56	55	67	4	288 04 35 s 111 16 w 9.26
05	05	881118	18.52	55	67	56	4	288 04 35 s 111 16 w 9.26
05	06	881118	18.52	64	69	31	4	288 04 32 s 111 27 w 6.79
05	07	881118	18.52	64	69	31	4	288 04 32 s 111 27 w 4.01
05	08	881118	18.52	69	31	64	11	03 285 04 35 s 111 33 w 6.79
06	01	881118	18.52	31	64	69	11	03 285 04 35 s 111 33 w 1.54
06	02	881119	18.52	55	67	56	06	03 286 04 14 s 112 48 w 11.11
01	01	881119	18.52	67	55	55	06	04 11 s 112 58 w 10.80

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
				left right rec.	horz. vert.					
01	03	881119	18.52	56	55	67	06	03	4	286
01	04	881119	18.52	56	55	67	06	02	4	286
01	05	881119	18.52	69	31	64	06	02	4	286
01	06	881119	18.52	31	64	69	31	02	3	286
02	01	881119	18.52	64	69	31	64	07	02	286
02	02	881119	18.52	55	67	56	56	07	03	286
03	01	881119	18.52	67	56	55	65	07	03	286
03	02	881119	18.52	67	56	55	65	07	03	286
03	03	881119	18.52	56	55	67	56	07	04	286
03	04	881119	18.52	69	31	64	69	08	01	286
03	05	881119	18.52	69	31	64	69	09	01	286
04	01	881119	18.52	31	64	69	31	01	4	286
04	02	881119	18.52	31	64	69	31	01	4	286
05	01	881119	18.52	55	67	56	56	09	01	325
05	02	881119	18.52	67	56	55	67	09	02	325
05	03	881119	18.52	67	56	55	67	11	02	4
05	04	881119	18.52	56	55	67	55	11	02	4
05	05	881119	18.52	69	31	64	69	10	02	4
06	01	881119	18.52	31	64	69	31	02	4	310
06	02	881119	18.52	31	64	69	31	02	4	310
06	03	881119	18.52	64	69	31	64	10	02	4
07	01	881119	18.52	55	67	56	56	10	03	5
07	02	881119	18.52	67	56	55	67	10	03	5
07	03	881119	18.52	56	55	67	55	10	03	5
07	04	881119	18.52	56	55	67	55	10	03	5
07	05	881119	18.52	31	64	69	31	02	5	310
07	06	881119	18.52	31	64	69	31	02	5	310
07	07	881119	18.52	56	55	67	55	10	03	5
01	01	881120	18.52	31	64	69	31	04	4	279
01	02	881120	18.52	31	64	69	31	04	4	267
02	01	881120	18.52	31	64	69	31	04	4	280
02	02	881120	18.52	64	69	31	64	07	03	29
02	03	881120	18.52	64	69	31	64	07	03	29
02	04	881120	18.52	69	31	64	69	07	03	280
02	05	881120	18.52	56	55	67	56	06	02	4
02	06	881120	18.52	56	55	67	55	06	02	4
02	07	881120	18.52	56	55	67	55	06	02	4
02	08	881120	18.52	56	55	67	55	06	02	4
02	09	881120	18.52	55	67	56	55	07	02	4
02	10	881120	18.52	55	67	56	55	07	02	4
02	11	881120	18.52	55	67	56	55	07	01	4
02	12	881120	18.52	67	56	55	67	07	02	4
02	13	881120	18.52	31	64	69	31	07	01	4
02	14	881120	18.52	64	69	31	64	07	01	4
02	15	881120	18.52	69	31	64	69	07	01	4
02	16	881120	18.52	69	31	64	69	08	01	4
02	17	881120	18.52	56	55	67	55	08	12	4
02	18	881120	18.52	56	55	67	55	08	01	280
02	19	881120	18.52	55	67	56	55	09	01	280
02	20	881120	18.52	55	67	56	55	10	01	4
02	21	881120	18.52	67	56	55	67	10	01	4
03	01	881120	18.52	31	64	69	11	01	3	280
03	02	881120	18.52	31	64	69	10	01	3	310
03	03	881120	18.52	64	69	31	10	01	3	310
03	04	881120	18.52	69	31	64	10	01	3	310
04	01	881120	18.52	69	31	64	10	02	3	310

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position		course (deg.)	position latitude	longitude	km in leg	
					left	right					
04	02	881120	18.52	56	55	67	10	02	3	310	
04	03	881120	18.52	55	67	56	10	02	3	310	
04	04	881120	18.52	67	56	55	10	02	3	310	
04	05	881120	18.52	31	64	69	10	02	3	310	
04	01	881120	18.52	31	64	69	10	03	3	310	
05	02	881120	18.52	64	69	31	10	03	3	310	
06	01	881120	18.52	64	69	31	10	03	3	310	
06	02	881120	18.52	64	69	31	10	03	3	310	
01	01	881121	18.52	67	56	55	2	270	02	34 s	
01	02	881121	18.52	56	67	55	2	270	02	34 s	
02	01	881121	18.52	55	67	56	07	02	2	270	
02	02	881121	18.52	55	67	56	07	02	1	270	
02	03	881121	18.52	64	69	31	07	02	1	270	
02	04	881121	18.52	69	31	64	07	02	2	270	
03	01	881121	18.52	69	31	64	07	01	2	270	
03	02	881121	18.52	31	64	69	07	01	2	270	
03	03	881121	18.52	67	56	55	07	01	2	270	
03	04	881121	18.52	67	56	55	06	01	2	300	
03	05	881121	18.52	67	56	55	07	01	2	300	
03	06	881121	18.52	56	67	67	07	01	2	270	
03	07	881121	18.52	55	67	56	08	01	1	270	
04	01	881121	18.52	64	69	31	09	01	1	270	
04	02	881121	18.52	64	69	31	09	01	1	270	
04	05	881121	18.52	69	31	64	09	01	2	270	
05	02	881121	18.52	69	31	64	09	01	2	270	
06	01	881121	18.52	69	31	64	09	01	2	270	
06	07	881121	18.52	69	31	64	09	01	2	270	
07	02	881121	18.52	31	64	69	09	01	2	270	
07	03	881121	18.52	67	56	55	09	01	2	270	
07	04	881121	18.52	67	56	55	10	01	3	270	
08	01	881121	18.52	67	56	55	10	01	3	270	
08	02	881121	18.52	56	67	55	67	10	01	3	270
08	03	881121	18.52	55	67	56	67	10	02	3	270
08	04	881121	18.52	55	67	56	67	10	02	3	270
08	05	881121	18.52	64	69	31	10	02	3	310	
08	06	881121	18.52	69	31	64	10	02	3	310	
08	07	881121	18.52	31	64	69	10	02	3	310	
08	08	881121	18.52	67	56	55	67	10	02	3	310
08	09	881121	18.52	56	67	55	67	10	03	3	310
08	10	881121	18.52	55	67	56	67	10	03	3	310
08	11	881121	18.52	55	67	56	67	10	03	3	310
08	12	881121	18.52	55	67	56	67	10	03	3	310
08	13	881121	18.52	69	31	64	4	270	02	25 s	
01	01	881122	18.52	69	31	64	4	270	02	25 s	
01	02	881122	18.52	31	64	69	4	270	02	25 s	
02	01	881122	18.52	55	67	56	4	270	02	31 s	
02	02	881122	18.52	67	56	55	67	07	02	31 s	
02	03	881122	18.52	56	67	55	67	07	02	31 s	
02	04	881122	18.52	56	67	55	67	07	02	31 s	
03	01	881122	18.52	69	31	64	4	270	02	32 s	
03	02	881122	18.52	69	31	64	4	270	02	32 s	
03	03	881122	18.52	31	64	69	4	270	02	33 s	
03	04	881122	18.52	64	69	31	8	01	4	270	
04	01	881122	18.52	64	69	31	8	01	4	270	
04	02	881122	18.52	56	67	55	67	07	02	33 s	
04	03	881122	18.52	56	67	55	67	07	02	33 s	
04	04	881122	18.52	55	67	55	67	07	02	33 s	

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position		course (deg.)	latitude	longitude	km in leg	
					left	right					
04	04	881122	18.52	55	67	56	08	01	4	295	
04	05	881122	18.52	56	67	55	08	01	4	295	
04	06	881122	18.52	56	67	55	09	01	4	295	
04	07	881122	18.52	56	67	55	09	01	4	295	
04	08	881122	18.52	56	67	55	10	01	4	295	
04	09	881122	18.52	56	67	55	10	01	4	295	
04	10	881122	18.52	55	67	56	10	02	4	295	
04	11	881122	18.52	56	67	55	10	02	4	295	
04	12	881122	18.52	56	67	55	10	02	4	295	
04	13	881122	18.52	56	67	55	11	02	4	295	
04	14	881122	18.52	51	64	69	31	10	02	4	295
04	15	881122	18.52	31	64	69	10	02	4	295	
04	16	881122	18.52	64	69	31	03	03	4	295	
04	17	881122	18.52	64	69	31	07	03	4	267	
04	01	881123	18.52	56	55	67	07	03	4	267	
01	02	881123	18.52	56	55	67	07	03	4	267	
01	03	881123	18.52	55	67	56	07	03	4	267	
01	04	881123	18.52	55	67	56	07	03	4	267	
01	05	881123	18.52	55	67	56	07	03	4	267	
01	06	881123	18.52	55	67	56	07	03	4	267	
01	07	881123	18.52	67	56	55	07	02	4	267	
01	08	881123	18.52	31	64	12	07	02	4	267	
01	09	881123	18.52	64	12	31	07	02	4	267	
01	10	881123	18.52	12	31	64	07	02	4	267	
01	11	881123	18.52	56	55	67	07	01	4	267	
01	12	881123	18.52	55	67	56	07	01	4	267	
01	13	881123	18.52	67	56	55	08	01	4	267	
01	14	881123	18.52	67	56	55	09	01	4	267	
01	15	881123	18.52	31	64	12	09	01	4	267	
02	01	881123	18.52	31	64	12	10	01	4	267	
02	02	881123	18.52	64	12	31	10	01	4	267	
02	03	881123	18.52	12	31	64	11	01	4	267	
02	04	881123	18.52	12	31	64	11	01	4	270	
02	05	881123	18.52	56	55	67	11	01	4	270	
02	06	881123	18.52	56	55	67	10	01	4	290	
02	07	881123	14.82	56	55	67	10	01	4	290	
02	08	881123	14.82	55	67	56	10	01	4	290	
02	09	881123	12.04	55	67	56	10	01	4	290	
02	10	881123	12.04	55	67	56	06	01	4	062	
02	11	881123	12.04	67	56	55	06	02	4	062	
02	12	881123	12.04	67	56	55	06	02	4	062	
02	13	881123	12.04	67	56	55	06	02	4	062	
02	14	881123	18.52	67	56	55	06	02	4	062	
02	15	881123	18.52	31	64	12	06	02	4	062	
02	16	881123	18.52	64	12	31	06	02	4	062	
02	17	881123	18.52	64	12	31	06	02	4	062	
02	18	881123	18.52	12	31	64	06	02	4	062	
03	01	881123	18.52	56	55	67	06	03	4	062	
03	02	881123	18.52	56	55	67	06	03	4	062	
04	01	881123	18.52	55	67	56	06	04	4	062	
05	02	881123	18.52	55	67	56	06	04	4	062	
05	03	881123	18.52	55	67	56	06	04	4	062	
05	04	881123	18.52	55	67	56	06	04	4	062	
05	05	881123	18.52	55	67	56	06	04	4	062	

Table 2. (continued)

series	leg	date	speed km/hr	left	right	observer codes	sun position	beauf. no.	course (deg.)	latitude	longitude	km in leg
01	01	881124	18.52	64	69	31	5	070	01 28 s	127 00 w	10.80	
01	02	881124	18.52	69	31	64	5	070	01 28 s	127 00 w	3.09	
01	03	881124	18.52	69	31	64	5	070	01 28 s	127 00 w	8.33	
01	04	881124	18.52	31	64	69	02	070	01 28 s	127 00 w	10.19	
01	05	881124	18.52	67	56	55	01	070	01 28 s	127 00 w	4.63	
01	06	881124	18.52	67	56	55	02	070	01 28 s	127 00 w	1.54	
01	07	881124	18.52	67	56	55	01	070	01 28 s	127 00 w	6.17	
01	08	881124	18.52	56	55	67	01	070	01 28 s	127 00 w	12.04	
02	01	881124	18.52	55	67	56	02	070	01 28 s	127 00 w	2.47	
02	02	881124	18.52	55	67	56	02	070	01 28 s	127 00 w	9.26	
02	03	881124	18.52	64	69	31	02	070	01 28 s	127 00 w	2.78	
02	04	881124	18.52	64	69	31	02	070	01 28 s	127 00 w	5.86	
03	01	881124	18.52	64	69	31	02	064	01 15 s	126 31 w	12.35	
03	02	881124	18.52	69	31	64	02	064	01 15 s	126 31 w	12.35	
03	03	881124	18.52	31	64	69	03	064	01 08 s	126 22 w	6.17	
03	04	881124	18.52	67	56	55	04	064	01 08 s	126 22 w	6.17	
03	05	881124	18.52	56	55	67	04	064	01 08 s	126 22 w	3.09	
03	06	881124	18.52	55	67	56	05	064	01 08 s	126 22 w	3.09	
03	07	881124	18.52	55	67	56	05	064	01 08 s	126 22 w	3.09	
04	01	881124	18.52	64	69	31	06	064	00 59 s	126 06 w	12.35	
04	02	881124	18.52	69	31	64	06	064	00 56 s	126 02 w	1.23	
05	01	881124	18.52	69	31	64	06	064	00 56 s	126 02 w	8.03	
05	02	881124	18.52	31	64	69	06	064	00 56 s	126 02 w	12.35	
05	03	881124	18.52	67	56	55	06	064	00 56 s	126 02 w	9.26	
05	04	881124	18.52	56	55	67	06	064	00 46 s	125 45 w	9.26	
05	05	881124	18.52	55	67	56	06	064	00 46 s	125 45 w	9.26	
05	06	881124	18.52	64	69	31	06	064	00 46 s	125 45 w	6.17	
05	07	881124	18.52	69	31	64	06	064	00 46 s	125 45 w	6.79	
01	01	881125	18.52	69	31	64	03	03	00 09 s	124 27 w	4.01	
01	02	881125	18.52	31	64	69	02	000	00 09 s	124 27 w	7.10	
02	02	881125	18.52	64	69	31	04	02	000	00 09 s	124 27 w	3.40
02	03	881125	18.52	64	69	31	02	000	00 09 s	124 27 w	4.32	
02	04	881125	18.52	55	67	56	05	01	000	00 09 s	124 27 w	7.72
02	05	881125	18.52	55	67	56	05	01	000	00 09 s	124 27 w	1.54
02	06	881125	18.52	55	67	56	02	000	00 10 n	124 24 w	3.09	
02	07	881125	18.52	67	56	55	05	01	000	00 12 n	124 24 w	0.93
03	01	881125	18.52	67	56	55	05	01	000	00 15 n	124 25 w	3.09
03	02	881125	18.52	67	56	55	05	01	000	00 15 n	124 25 w	2.16
03	03	881125	18.52	56	55	67	05	01	000	00 15 n	124 25 w	9.26
03	04	881125	18.52	56	55	67	05	01	000	00 23 n	124 26 w	3.09
03	05	881125	18.52	56	55	67	06	01	000	00 24 n	124 26 w	1.23
03	06	881125	18.52	69	31	64	06	01	000	00 24 n	124 26 w	9.26
04	01	881125	18.52	31	64	69	07	01	000	00 29 n	124 29 w	6.17
04	02	881125	18.52	64	69	31	07	01	000	00 29 n	124 29 w	6.79
05	01	881125	18.52	55	67	56	08	01	000	00 35 n	124 30 w	1.23
06	01	881125	18.52	67	56	55	08	02	000	00 45 n	124 32 w	10.49
06	02	881125	18.52	56	55	67	08	02	000	00 45 n	124 32 w	10.49
06	03	881125	18.52	69	31	64	08	02	000	00 57 n	124 35 w	9.26
06	04	881125	18.52	31	64	69	08	02	000	01 02 n	124 36 w	6.79
07	01	881125	18.52	64	69	31	08	03	000	01 06 n	124 37 w	8.95
07	02	881125	18.52	55	67	56	08	03	000	01 06 n	124 37 w	4.01
07	03	881125	18.52	55	67	56	08	03	000	01 13 n	124 39 w	0.31
01	01	881126	17.59	31	64	69	03	03	000	02 45 n	124 37 w	10.56
01	02	881126	17.59	64	69	31	03	04	025	02 45 n	124 37 w	9.97

Table 2. (continued)

series	leg	date	speed km/hr	left	right	observer codes	sun position	beauf. no.	course (deg.)	latitude	longitude	km in leg	
01	03	881126	17.59	69	31	64	03	02	4	025	03 02 n	124 32 w	10.26
01	04	881126	18.52	56	55	67	03	02	4	025	03 02 n	124 32 w	12.35
01	05	881126	18.52	55	67	56	03	02	4	025	03 02 n	124 32 w	7.72
01	06	881126	18.52	55	67	56	04	01	4	025	03 15 n	124 31 w	4.63
01	07	881126	18.52	67	56	55	04	01	4	020	03 15 n	124 31 w	2.47
02	01	881126	18.52	31	64	69	04	01	4	020	03 33 n	124 28 w	6.17
02	02	881126	18.52	64	69	31	04	01	4	020	03 33 n	124 28 w	13.27
02	03	881126	18.52	64	69	31	04	01	4	020	03 33 n	124 28 w	7.72
03	01	881126	18.52	69	31	64	05	01	4	020	03 33 n	124 28 w	4.32
03	02	881126	18.52	56	55	67	05	01	4	020	03 33 n	124 28 w	1.23
03	03	881126	18.52	56	55	67	05	01	4	020	03 33 n	124 28 w	12.04
03	04	881126	18.52	55	67	56	06	01	4	020	03 46 n	124 27 w	4.01
03	05	881126	18.52	55	67	56	06	01	4	020	03 46 n	124 27 w	1.85
03	06	881126	18.52	55	67	56	06	01	4	020	03 50 n	124 25 w	6.17
04	01	881126	18.52	67	56	55	07	01	4	020	03 54 n	124 30 w	1.85
05	01	881126	18.52	31	64	69	07	01	4	020	04 13 n	124 31 w	3.40
05	02	881126	18.52	31	64	69	07	01	4	020	04 17 n	124 25 w	7.10
05	03	881126	18.52	31	64	69	07	01	4	020	04 20 n	124 14 w	6.48
05	04	881126	18.52	64	69	31	07	02	3	020	04 05 n	124 31 w	1.85
06	01	881126	18.52	64	69	31	07	02	3	020	04 05 n	124 31 w	2.16
06	02	881126	18.52	69	31	64	07	02	3	020	04 13 n	124 31 w	6.17
07	01	881126	18.52	56	55	67	07	02	3	020	04 17 n	124 25 w	4.63
08	01	881126	18.52	55	67	56	07	02	3	020	04 20 n	124 14 w	9.26
08	02	881126	18.52	31	64	69	07	02	3	020	04 23 n	124 11 w	10.80
09	01	881127	18.52	67	56	55	07	02	3	013	06 00 n	124 23 w	9.57
09	02	881127	18.52	56	55	67	07	02	3	013	06 17 n	124 15 w	2.16
09	03	881127	18.52	64	69	31	07	02	3	013	06 18 n	124 15 w	3.09
09	04	881127	18.52	64	69	31	07	02	3	013	06 20 n	124 14 w	4.32
09	05	881127	18.52	64	69	31	07	02	3	012	06 23 n	124 11 w	4.32
09	06	881127	18.52	64	69	31	07	02	3	012	06 26 n	124 10 w	3.09
09	07	881127	18.52	31	64	69	04	02	3	012	06 29 n	124 10 w	9.26
09	08	881127	18.52	31	64	69	04	01	3	012	06 33 n	124 08 w	12.35
09	09	881127	18.52	67	56	55	04	01	3	012	06 33 n	124 08 w	8.95
09	10	881127	18.52	56	55	67	05	05	05	012	06 44 n	124 03 w	3.09
09	11	881127	18.52	55	67	56	06	01	05	012	06 46 n	124 03 w	2.16
09	12	881127	18.52	55	67	56	06	01	05	012	06 47 n	124 02 w	7.10
09	13	881127	18.52	64	69	31	06	01	05	006	06 50 n	124 01 w	8.33
09	14	881127	18.52	64	69	31	06	01	05	006	06 55 n	124 00 w	4.01
09	15	881127	18.52	64	69	31	06	01	05	012	06 44 n	123 58 w	4.32
09	16	881127	18.52	64	69	31	06	01	05	012	06 46 n	123 57 w	5.86
09	17	881127	18.52	64	69	31	06	01	05	006	06 47 n	123 59 w	5.56
09	18	881127	18.52	64	69	31	06	01	05	006	06 50 n	123 59 w	1.85
09	19	881127	18.52	64	69	31	06	01	05	006	06 55 n	123 58 w	2.16
09	20	881127	18.52	56	55	67	07	01	05	006	07 04 n	123 58 w	3.70
09	21	881127	18.52	56	55	67	07	01	05	006	07 08 n	123 57 w	1.85
09	22	881127	18.52	64	69	31	06	01	05	006	07 10 n	123 59 w	2.47
10	01	881127	18.52	56	55	67	07	01	05	006	07 17 n	123 57 w	4.01
10	02	881127	18.52	31	64	69	07	01	05	006	07 03 n	123 58 w	0.93
10	03	881127	18.52	64	69	31	06	01	05	006	07 04 n	123 58 w	4.32
10	04	881127	18.52	64	69	31	06	01	05	006	07 08 n	123 57 w	5.86
10	05	881127	18.52	64	69	31	06	01	05	006	07 10 n	123 59 w	5.56
10	06	881127	18.52	56	55	67	07	01	05	006	07 29 n	123 54 w	1.85
10	07	881127	18.52	56	55	67	07	01	05	005	07 08 n	123 20 w	2.47
01	01	881128	18.52	64	69	31	06	01	05	005	07 17 n	123 57 w	4.01

Table 2. (continued)

series	leg	date	speed km/hr	observer left	right	codes rec.	sun position horz. vert.	beauf. no.	course (deg.)	latitude longitude	position km in leg
02	01	881128	18.52	31	64	69	08	02	5	005	10 11 n 123 18 w 4.01
03	01	881128	18.52	64	69	31	08	02	4	005	10 17 n 123 19 w 4.32
03	02	881128	18.52	55	67	56	08	02	4	005	10 28 n 123 18 w 9.26
03	03	881128	18.52	67	56	55	08	03	4	005	10 28 n 123 18 w 9.26
03	04	881128	18.52	56	55	67	08	03	4	005	10 28 n 123 18 w 6.17
03	05	881128	18.52	56	55	67	08	03	4	005	10 28 n 123 18 w 0.93
03	06	881128	18.52	69	31	64	08	03	4	005	10 28 n 123 18 w 6.48
01	01	881129	18.52	56	55	67	08	03	4	020	12 13 n 122 57 w 10.49
01	02	881129	18.52	55	67	56	03	03	4	020	12 24 n 122 52 w 4.32
01	03	881129	18.52	55	67	56	03	02	4	020	12 30 n 122 52 w 12.35
02	01	881129	18.52	31	64	69	03	02	4	020	12 35 n 122 49 w 4.94
02	02	881129	18.52	64	69	31	03	02	4	020	12 38 n 122 48 w 2.78
03	01	881129	18.52	64	69	31	04	02	3	020	12 44 n 122 46 w 6.17
03	02	881129	18.52	69	31	64	04	02	3	020	12 44 n 122 46 w 3.09
03	03	881129	18.52	69	31	64	04	02	3	020	12 44 n 122 46 w 2.78
04	01	881129	18.52	64	69	31	04	02	3	020	12 44 n 122 46 w 3.70
04	02	881129	18.52	56	55	67	04	02	3	020	12 46 n 122 45 w 7.10
05	01	881129	18.52	56	55	67	04	01	3	020	12 46 n 122 45 w 6.17
05	02	881129	18.52	55	67	56	05	01	4	020	12 53 n 122 42 w 6.17
05	03	881129	18.52	55	67	56	05	01	4	013	12 53 n 122 42 w 11.42
05	04	881129	18.52	67	56	55	05	01	4	013	13 01 n 122 40 w 4.01
05	05	881129	18.52	31	64	69	06	01	5	013	13 03 n 122 41 w 2.47
06	01	881129	18.52	31	64	69	06	01	5	013	13 03 n 122 41 w 11.73
06	02	881129	18.52	64	69	31	06	01	5	013	13 03 n 122 41 w 9.26
06	03	881129	18.52	69	31	64	06	01	5	013	13 03 n 122 41 w 3.09
06	04	881129	18.52	69	31	64	06	01	4	013	13 19 n 122 40 w 8.33
06	05	881129	18.52	56	55	67	06	01	4	013	13 24 n 122 40 w 4.01
06	06	881129	18.52	56	55	67	07	02	4	013	13 24 n 122 40 w 4.63
06	07	881129	18.52	55	67	56	07	02	4	013	13 29 n 122 40 w 1.54
06	08	881129	18.52	55	67	56	07	02	4	013	13 29 n 122 40 w 1.54
06	09	881129	18.52	55	67	56	07	02	4	020	13 29 n 122 40 w 4.63
06	10	881129	18.52	55	67	56	07	02	4	020	13 29 n 122 40 w 1.85
06	11	881129	18.52	67	56	55	07	02	4	020	13 29 n 122 40 w 4.32
06	12	881129	18.52	67	56	55	07	02	4	020	13 29 n 122 40 w 1.85
06	13	881129	18.52	67	56	55	07	02	4	020	13 29 n 122 40 w 4.63
06	14	881129	18.52	67	56	55	07	02	4	020	13 29 n 122 40 w 1.54
06	15	881129	18.52	31	64	69	07	03	5	020	13 39 n 122 38 w 9.26
06	16	881129	18.52	64	69	31	07	03	5	020	13 41 n 122 35 w 3.40
06	17	881129	18.52	64	69	31	07	03	5	020	13 44 n 122 34 w 2.16
06	18	881129	18.52	64	69	31	07	02	4	016	16 44 n 121 55 w 0.31
01	01	881130	18.52	64	69	31	07	02	4	016	16 44 n 121 55 w 10.19
02	02	881130	18.52	55	67	56	07	02	4	016	16 53 n 121 51 w 9.26
01	03	881130	18.52	67	56	55	08	02	4	016	16 53 n 121 51 w 7.72
01	04	881130	18.52	56	55	67	08	02	4	016	16 58 n 121 51 w 0.62
02	01	881130	18.52	56	55	67	08	02	4	016	16 58 n 121 51 w 2.16
02	02	881130	18.52	55	67	56	03	03	2	013	18 49 n 121 26 w 9.57
02	02	881201	18.52	67	55	67	03	03	2	013	18 52 n 121 26 w 9.57
02	03	881201	18.52	69	31	64	03	02	2	013	18 56 n 121 25 w 9.26

Table 2. (continued)

series	leg	date	speed km/hr	observer left	observer right	codes rec.	sun position horz. vert.	beauf. no.	course (deg.)	position latitude	km in leg
02	04	881201	18.52	69	31	64	2	013	19 06 n	121 24 w	3.09
02	05	881201	18.52	64	31	69	2	013	19 15 n	121 21 w	12.35
02	06	881201	18.52	64	69	31	2	030	19 17 n	121 20 w	3.40
02	07	881201	18.52	64	69	31	2	030	19 20 n	121 19 w	2.47
02	08	881201	18.52	64	55	67	2	030	19 24 n	121 16 w	6.48
02	09	881201	18.52	55	67	56	2	030	19 26 n	121 15 w	9.26
02	10	881201	18.52	55	67	56	2	030	19 29 n	121 15 w	3.09
02	11	881201	18.52	67	56	55	04	01	19 49 n	121 08 w	12.35
02	12	881201	18.52	56	55	67	04	01	19 51 n	121 04 w	12.35
02	13	881201	18.52	69	31	64	05	01	19 55 n	121 04 w	5.25
02	14	881201	18.52	31	64	69	05	01	19 59 n	121 01 w	1.23
03	01	881201	18.52	64	69	31	2	030	20 01 n	121 00 w	6.17
03	02	881201	18.52	55	67	56	2	030	20 02 n	120 50 w	4.32
04	01	881201	18.52	55	67	56	2	030	20 05 n	120 46 w	5.56
04	02	881201	18.52	55	67	56	2	030	20 08 n	120 44 w	0.31
05	01	881201	18.52	56	55	67	1	030	21 39 n	119 51 w	4.63
06	01	881201	18.52	69	31	64	1	030	21 46 n	119 43 w	2.47
07	01	881201	18.52	31	64	69	03	02	21 56 n	119 30 w	12.35
07	02	881201	18.52	31	64	69	03	02	21 59 n	119 31 w	6.17
01	01	881202	18.52	31	64	69	03	02	22 05 n	119 31 w	12.35
01	02	881202	18.52	31	64	69	03	02	22 15 n	119 24 w	3.09
02	01	881202	18.52	64	69	31	03	02	22 19 n	119 20 w	2.78
02	02	881202	18.52	56	55	67	03	02	22 23 n	119 19 w	1.85
02	03	881202	18.52	55	67	56	03	02	22 28 n	119 09 w	4.32
02	04	881202	18.52	55	67	56	02	02	22 33 n	117 58 w	3.40
02	05	881202	18.52	67	56	55	04	02	22 37 n	117 55 w	3.70
02	06	881202	18.52	56	55	67	05	02	23 08 n	117 53 w	6.17
02	07	881202	18.52	64	69	31	05	02	23 38 n	117 52 w	4.94
02	08	881202	18.52	64	69	31	04	02	24 21 n	118 02 w	1.85
03	01	881202	18.52	64	69	31	04	02	24 24 n	118 00 w	2.16
03	02	881202	18.52	67	56	55	03	03	24 33 n	117 58 w	7.41
03	03	881202	18.52	56	55	67	03	03	24 37 n	117 55 w	5.56
03	04	881202	18.52	56	55	67	03	03	24 38 n	117 53 w	0.62
02	01	881203	18.52	55	67	56	03	02	24 39 n	117 50 w	6.17
02	02	881203	18.52	64	69	31	02	02	24 49 n	117 45 w	10.80
03	01	881203	18.52	69	64	69	05	02	24 53 n	117 42 w	7.10
03	02	881203	18.52	67	56	67	05	02	24 54 n	117 42 w	2.16
04	01	881203	18.52	67	56	55	04	02	24 54 n	117 42 w	12.66
04	02	881203	18.52	67	56	55	05	02	24 54 n	117 42 w	3.09
04	03	881203	18.52	56	55	67	05	02	24 54 n	117 42 w	3.40
04	04	881203	18.52	55	67	64	05	02	24 54 n	117 42 w	2.47
05	01	881203	18.52	55	67	64	05	02	24 54 n	117 42 w	6.48
05	02	881203	18.52	64	69	31	05	02	24 54 n	117 42 w	9.26

Table 2. (continued)

series	leg	date	speed km/hr	observer codes	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
05	03	881203	18.52	69	31	64	06	02	3	030
05	04	881203	18.52	31	64	69	06	02	3	030
05	05	881203	18.52	67	56	55	06	02	3	030
05	06	881203	18.52	56	55	67	07	02	3	030
06	01	881203	18.52	56	55	67	07	02	3	030
06	02	881203	18.52	55	67	56	07	02	3	030
06	03	881203	18.52	55	67	56	07	03	3	030
06	04	881203	18.52	55	67	56	07	03	4	030
07	01	881203	18.52	64	69	31	07	03	4	030
total distance travelled on effort:										133389.61 km.

Table 3. Marine mammal sightings, classified by species code groups, encountered in the eastern tropical Pacific aboard the McArthur during July 28 through December 6, 1988.

Sightings by Species												
species: OFFSHORE SPOTTED DOLPHIN (STENELLA ATTENUATA)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
ymdry	number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low	
880730	04	01	03	12	01	1	70	1.1	27 11 n	121 27 w	100.0	
880730	05	02	04	03	01	1	68	1.8	27 03 n	121 23 w	100.0	
880731	03	02	02	02	01	1	51	0.9	24 21 n	120 26 w	100.0	
880801	03	03	02	04	05	0.5	6.0	19 43 n	118 53 w	100.0	67.0	
880802	01	02	01	07	04	68	0.4	17 49 n	118 18 w	100.0	223.0	
880803	05	01	01	07	03	51	0.8	13 55 n	118 10 w	100.0	121.0	
880810	01	03	01	07	05	51	0.7	06 19 n	114 39 w	100.0	93.0	
880810	07	02	08	10	02	5	70	0.6	06 59 n	115 44 w	100.0	78.0
880816	04	02	04	02	04	2	70	2.5	12 57 n	130 16 w	9.5	95.0
880818	02	01	01	01	01	1	68	0.0	11 33 n	133 54 w	63.3	117.0
880818	02	01	02	01	02	1	51	0.0	11 33 n	133 54 w	200.0	319.0
880904	02	01	02	10	03	3	68	0.7	10 01 n	147 00 w	100.0	260.0
880904	02	01	03	10	03	3	38	2.7	10 01 n	147 00 w	100.0	129.0
880907	01	01	01	01	04	6	68	0.1	04 58 n	137 19 w	50.0	160.0
880909	04	02	02	08	02	0.2	68	0.8	06 23 n	130 23 w	48.3	170.0
880914	02	07	02	01	07	5	68	4.7	04 14 n	118 21 w	79.3	225.0
880914	03	08	03	05	38	0.5	0.5	0.4	18 n	117 46 w	20.0	183.0
880916	03	02	03	12	02	4	51	2.7	04 42 n	112 33 w	60.0	128.0
880916	06	01	04	04	05	0.5	0.9	0.4	53 n	111 45 w	26.7	170.0
880919	03	06	02	02	04	4	68	0.0	03 30 n	102 24 w	100.0	195.0
881014	02	01	01	01	07	4	69	0.5	02 14 n	093 30 w	95.0	150.0
881014	03	01	02	04	02	4	55	1.4	02 20 n	093 35 w	31.7	157.0
881014	08	05	06	09	01	5	56	1.1	03 03 n	093 56 w	100.0	233.0
881020	02	03	02	12	03	3	55	0.9	02 57 s	099 32 w	9.6	225.0
881110	03	04	06	06	02	4	31	1.5	09 33 s	085 49 w	55.0	157.0
881110	04	04	06	06	02	0.1	69	0.5	02 14 n	093 30 w	95.0	163.0
881110	04	04	08	09	12	3	55	3.1	09 27 s	086 05 w	100.0	165.0
881116	01	05	03	05	03	4	56	3.6	05 16 s	104 15 w	3.0	188.0
881125	01	01	01	01	01	1	31	3.4	00 07 s	124 27 w	100.0	292.0
881125	02	07	02	05	01	2	67	0.8	00 12 n	124 24 w	100.0	45.0
881126	04	01	05	07	01	4	67	3.3	03 50 n	124 25 w	78.3	35.0
881126	06	02	07	07	02	3	69	2.1	04 07 n	124 31 w	65.7	175.0
881127	11	01	10	07	01	0.2	64	0.5	07 29 n	123 54 w	97.3	212.0
881201	01	01	03	03	03	2	67	0.3	18 51 n	121 25 w	100.0	238.0
881201	05	01	04	01	04	1	55	2.9	20 04 n	120 58 w	100.0	212.0
881202	02	03	06	02	06	0.2	56	5.6	22 24 n	119 16 w	100.0	90.0

Table 3. (continued)

Table 3. (continued)

Sightings by Species											
species: COMMON DOLPHIN (DELPHINUS DELPHIS)											
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est
YMD				number	horz.	vert.	number	by	dist. (km)	deg min	
										(% of school)	best low
880730	01	10	01	05	02	3	05	3.8	27 41 n	121 35 w	100.0 20.0
880804	02	16	01	05	02	3	70	0.0	11 46 n	116 16 w	100.0 57.0
880923	03	01	03	12	12	3	38	3.0	00 04 n	092 56 w	100.0 49.0
880923	03	01	03	12	12	3	70	2.6	00 06 s	092 57 w	100.0 150.0
881008	02	08	03	08	04	5	55	0.2	04 22 n	082 43 w	100.0 400.0
881010	03	08	04	08	04	5	55	4.4	07 00 n	086 15 w	100.0 455.0
881017	01	01	01	01	01	1	31	2.1	00 04 n	100 18 w	100.0 400.0
881017	02	01	05	01	05	1	64	0.7	00 03 n	100 29 w	100.0 98.0
881017	03	03	06	08	02	1	55	4.3	00 06 s	100 39 w	100.0 87.0
881017	03	03	06	08	02	2	69	3.4	00 15 n	100 46 w	100.0 800.0
881017	05	01	08	01	01	2	69	3.4	00 38 s	101 22 w	100.0 716.0
881017	09	04	14	01	02	3	69	0.4	00 41 s	101 31 w	100.0 533.0
881017	10	02	15	02	15	4	55	3.8	00 39 s	101 32 w	100.0 65.0
881017	11	01	16	01	16	3	56	3.8	00 41 s	101 32 w	100.0 14.0
881018	02	04	02	04	02	3	69	0.1	01 49 s	103 00 w	100.0 16.0
881018	04	01	05	01	05	3	67	2.0	01 50 s	103 09 w	100.0 380.0
881018	07	03	09	09	12	3	64	0.3	02 02 s	103 24 w	100.0 78.0
881018	12	01	15	03	02	3	64	6.9	02 35 s	103 49 w	100.0 63.0
881020	07	01	07	05	01	4	31	1.1	02 45 s	098 45 w	100.0 88.0
881020	10	02	11	06	03	2	55	2.6	02 45 s	098 39 w	100.0 73.0
881021	03	05	03	05	03	2	64	0.2	02 48 s	096 33 w	100.0 29.0
881021	04	03	05	05	04	4	69	1.3	02 49 s	096 26 w	100.0 24.0
881026	01	05	02	01	02	3	64	0.7	03 50 s	087 58 w	100.0 5.0
881027	01	02	01	02	01	3	69	3.7	02 59 s	085 24 w	100.0 233.0
881027	03	01	03	10	02	3	67	1.3	03 04 s	085 28 w	100.0 0.0*
881027	04	01	04	10	02	3	55	2.2	03 08 s	085 28 w	100.0 22.0
881027	09	01	12	03	01	4	31	0.8	03 36 s	085 06 w	100.0 9.0
881027	13	02	15	03	02	3	55	7.1	03 52 s	084 55 w	100.0 8.0
881110	01	06	03	06	02	4	67	3.1	09 47 s	085 33 w	100.0 140.0
881204	02	03	02	03	02	1	31	4.8	27 37 n	115 00 w	100.0 127.0
881205	01	04	01	04	02	1	64	4.4	30 06 n	116 03 w	100.0 3150.0

Table 3. (continued)

Sightings by Species												
species: EASTERN SPINNER DOLPHIN (STENELLA LONGIROSTRIS)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size est
Yrmody				number	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best low
880803	05	01	07									
	03	01	02	04	02	3	51	0.8	13 55 n	118 10 w	70.0	93.0
881014							55	1.4	02 20 n	093 35 w	68.3	292.0
												78.0
												257.0

Table 3. (continued)

Sightings by Species													
species: WHITEBELLied SPINNER DOLPHIN (STENELLA LONGIROSTRIS)													
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est		
yr/mody			number	horz.	vert.	number	by	dist. (km)	deg min	(% of school)	best		
880810	01	03	01	05	10	02	5	51	0.7	06 19 n	114 39 w		
880815	01	01	01	05	03	4	70	0.1	13 20 n	127 53 w	53.7		
880815	01	08	02	04	1	68	3.8	12 24 n	126 28 w	100.0	74.0		
880816	04	02	04	01	2	70	2.5	13 22 n	129 25 w	100.0	115.0		
880816	08	01	09	01	01	5	2.9	12 57 n	130 16 w	73.8	364.0		
880816	08	01	01	01	3	38	5.1	12 52 n	130 34 w	100.0	65.0		
880817	01	01	02	12	12	22	0.0	13 36 n	131 41 w	100.0	29.0		
880817	03	10	02	12	5	22	0.0	12 58 n	132 19 w	100.0	37.0		
880817	04	04	03	12	01	5	38	0.6	12 47 n	132 25 w	100.0	15.0	
880817	05	08	04	01	3	5	4.5	12 31 n	132 41 w	28.0	11.0		
880818	02	01	01	02	01	68	0.0	11 33 n	133 54 w	36.7	260.0		
880818	07	02	02	06	02	05	1.2	10 55 n	134 47 w	100.0	200.0		
880822	04	01	04	01	3	68	1.5	12 53 n	143 54 w	100.0	153.0		
880903	02	15	02	01	10	03	4	51	0.7	11 40 n	148 30 w	100.0	43.0
880904	01	02	01	02	10	03	70	1.5	10 04 n	147 08 w	100.0	68.0	
880904	02	01	02	03	3	68	0.7	10 01 n	147 00 w	100.0	52.0		
880904	02	01	03	10	03	38	2.7	10 01 n	147 00 w	100.0	200.0		
880904	05	04	08	04	02	2	51	1.6	08 54 n	146 03 w	100.0	144.0	
880907			01		6	68	0.1	04 58 n	137 19 w	50.0	124.0		
880909	04	02	08	02	3	68	0.8	06 23 n	130 23 w	51.7	128.0		
880914	03	08	03	05	5	38	0.5	04 18 n	117 46 w	80.0	183.0		
880916	03	02	03	12	02	4	51	2.7	04 42 n	112 33 w	40.0	233.0	
880916	06	01	04	04	4	05	0.9	04 53 n	111 45 w	6.7	157.0		
881020	02	03	02	12	03	3	55	5.9	02 57 s	099 32 w	100.0	217.0	
881110	03	04	06	04	4	31	1.5	09 33 s	085 49 w	90.4	195.0		
881116	01	05	03	06	4	56	3.6	05 16 s	104 15 w	11.7	247.0		
881118	02	06	03	05	5	55	0.2	04 44 s	110 51 w	51.3	80.0		
881126	04	01	05	07	01	67	3.3	03 50 n	124 25 w	58.3	52.0		
881126	06	02	07	07	02	69	2.1	04 07 n	124 31 w	21.7	251.0		
										1.0	300.0		
										1100.0	157.0		
										1100.0	1100.0		

species code: 11

Table 3. (continued)

Sightings by Species														
species: STRIPED DOLPHIN (S. COERULEOALBA)														
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est		
yr/mo/dy				number	horz.	vert.	number	by	dist. (km)	deg min	(% of school)	best		
											low	high		
880730	02	02	02	1	68	5.3	27	42 n	121 34 w	100.0	38.0	31.0		
880731	01	01	01	1	22	1.0	24	33 n	120 33 w	100.0	21.0	13.0		
880801	10	10	01	5	38	0.0	20	42 n	119 11 w	100.0	34.0	25.0		
880807	01	03	01	6	70	0.2	06	37 n	109 59 w	100.0	2.0	2.0		
880808	02	01	02	3	38	1.8	04	39 n	109 23 w	100.0	20.0	36.0		
880809	01	04	02	05	3	0.1	05	20 n	111 55 w	100.0	21.0	16.0		
880810	04	02	04	12	68	1.8	06	32 n	116 17 w	100.0	60.0	45.0		
880813	02	07	03	5	38	5.1	09	58 n	122 35 w	100.0	31.0	29.0		
880815				10	02	4	70	0.1	13 20 n	127 53 w	21.3	69.0	44.0	
880816	05	01	05	05	2	0.5	1.5	12 56 n	130 26 w	90.0	10.0	10.0		
880816	09	01	10	2	51	1.2	12 50 n	130 38 w	100.0	45.0	35.0	35.0		
880816	10	06	11	2	22	0.2	13 07 n	130 51 w	100.0	35.0	29.0	29.0		
880817	05	08	04	3	05	4.5	1.2	21 n	132 41 w	72.0	68.0	52.0		
880818	03	03	03	08	02	0.5	7.7	11 21 n	134 08 w	100.0	133.0	95.0		
880818	04	03	05	08	01	3	38	1.8	11 16 n	134 21 w	100.0	96.0	73.0	
880910	01	02	02	02	03	1	0.5	0.9	07 48 n	128 48 w	100.0	212.0	127.0	
880910	02	04	04	11	02	1	38	0.7	07 48 n	128 32 w	100.0	34.0	27.0	
880910	03	01	05	11	01	1	68	1.1	07 46 n	128 28 w	100.0	28.0	22.0	
880910	06	02	07	12	12	1	0.5	0.4	07 37 n	128 13 w	100.0	8.0	7.0	
880910	07	02	08	12	12	1	68	0.1	07 29 n	128 04 w	100.0	70.0	50.0	
880910	08	01	09	04	01	1	51	0.6	07 24 n	127 57 w	100.0	105.0	82.0	
880919	01	01	01	5	38	0.0	0.0	03 40 n	103 34 w	100.0	97.0	67.0		
880926	03	01	02	01	02	4	38	0.2	01 00 s	088 33 w	100.0	97.0	72.0	
880926	05	01	05	01	02	5	0.5	0.7	00 41 s	088 09 w	100.0	53.0	42.0	
880927	02	09	04	09	08	0.2	3	0.5	0.1 4	00 41 n	084 35 w	94.3	75.0	
880928	02	04	03	03	02	03	4	99	0.1	03 25 n	081 48 w	100.0	5.0	4.0
880928	03	01	06	4	68	4.2	02	19 n	082 18 w	100.0	72.0	60.0		
880928	05	04	10	08	02	4	51	0.3	02 22 n	082 14 w	100.0	9.0	7.0	
881005	01	03	02	02	03	4	31	2.7	03 34 n	081 43 w	100.0	48.0	41.0	
881005	02	03	03	4	56	5.3	0.5	05 n	080 06 w	100.0	50.0	45.0		
881007	02	01	02	4	64	3.1	0.1	36 n	081 02 w	100.0	0.0	62.0		
881007	03	04	04	4	55	2.5	0.1	47 n	081 09 w	100.0	16.0	15.0		
881007	05	06	06	09	01	4	69	2.7	02 28 n	081 39 w	100.0	40.0	32.0	
881008	01	02	02	02	03	4	67	1.4	03 58 n	082 33 w	100.0	30.0	20.0	
881008	03	16	05	4	64	4.0	0.4	56 n	083 24 w	100.0	175.0	152.0		
881009	03	14	05	5	55	1.0	0.3	45 n	085 28 w	100.0	35.0	30.0		
881009	04	03	07	09	01	4	64	2.1	03 59 n	085 32 w	100.0	208.0	178.0	
881013	05	08	03	06	09	01	4	69	0.5	02 50 n	092 27 w	100.0	75.0	33.0
881014	07	03	07	08	03	1	55	3.1	00 06 s	100 39 w	100.0	77.0	65.0	
881017	06	04	10	12	3	55	1.6	00 27 s	100 58 w	100.0	97.0	85.0		
881017	03	04	10	10	04	3	51	5.2	01 50 s	103 04 w	100.0	28.0	25.0	

species code: 13

Table 3. (continued)

Sightings by Species														
species: STRIPED DOLPHIN (S. COERULEOALBA)														
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size est		
yr\m\dy			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best		
											low	high		
881018	06	03	07	01	01	2	56	1.0	01 58 S	103 18 W	100.0	13.0		
881018	09	03	11	04	05	4	55	1.1	02 25 S	103 37 W	100.0	43.0		
881019	02	19					31	1.6	02 57 S	101 11 W	100.0	38.0		
881020	04	05					55	1.7	02 50 S	099 06 W	100.0	7.0		
881020	04	05	01	01	01	4	56	2.0	02 49 S	098 57 W	100.0	65.0		
881020	05	01	05	01	01	4	69	3.3	02 48 S	098 49 W	100.0	82.0		
881020	06	01	06	12	12	4	31	1.1	02 44 S	098 23 W	100.0	72.0		
881020	09	07	10	05	02	4	31	2.9	02 49 S	096 58 W	100.0	62.0		
881021	01	01	01	01	01	3	31	2.6	02 45 S	096 43 W	100.0	77.0		
881021	02	07	02	02	02	3	55	3.5	03 05 S	096 05 W	100.0	87.0		
881021	02	07	03	11		4	55	0.4	04 46 S	095 59 W	100.0	86.0		
881021	09	03	01	02	10	02	31	3.4	05 59 S	095 36 W	100.0	74.0		
881022	02	05	12	05	03	02	4	56	0.8	07 23 S	092 05 W	100.0	72.0	
881022	05	12			02	12	4	69	1.1	03 50 S	087 58 W	100.0	86.0	
881024	04	01	04	02	02	12	3	64	0.7	03 50 S	087 1.3	100.0	74.0	
881024	04	01	04	02	02	12	3	55	0.4	03 08 S	087 13 W	100.0	125.0	
881026	01	05	02	05	06	08	01	2	55	0.4	03 07 S	087 10 W	100.0	207.0
881026	04	06	08	06	09	01	3	56	2.7	03 03 S	087 10 W	100.0	90.0	
881026	05	01	11	07	02	2	31	1.1	03 17 S	085 20 W	100.0	147.0		
881026	07	06	01	11	01	3	69	2.9	03 24 S	085 15 W	100.0	82.0		
881027	07	02	10	12	3	55	0.7	0.7	0.7	085 15 W	100.0	1233.0		
881027	07	02	10	12	3	55	0.7	0.7	0.7	085 15 W	100.0	1400.0		
881026	04	06	08	06	09	01	3	56	0.4	03 08 S	087 13 W	100.0	28.0	
881026	05	01	11	07	02	2	31	1.1	03 03 S	087 10 W	100.0	32.0		
881026	07	01	06	11	01	3	69	2.9	03 17 S	085 20 W	100.0	202.0		
881027	06	01	06	11	01	3	69	2.9	03 17 S	085 20 W	100.0	165.0		
881027	07	02	10	12	3	55	0.7	0.7	0.7	085 15 W	100.0	42.0		
881110	06	01	13	04	04	4	69	4.4	09 08 S	086 53 W	100.0	53.0		
881110	06	01	13	04	04	4	67	1.8	07 21 S	092 51 W	100.0	205.0		
881112	03	08	04	04	02	06	01	4	55	0.2	06 50 S	094 50 W	100.0	62.0
881113	01	14	02	05	03	01	5	64	5.8	06 38 S	095 14 W	100.0	252.0	
881113	02	05	03	01	01	4	56	3.0	06 05 S	097 27 W	100.0	82.0		
881114	01	03	01	03	10	12	4	56	0.2	04 54 S	110 23 W	100.0	60.0	
881114	03	09	03	09	11	12	4	64	3.5	05 58 S	098 19 W	100.0	24.0	
881114	08	03	09	03	09	11	2	64	3.5	05 51 S	099 1 W	100.0	72.0	
881116	01	05	03	01	07	01	4	56	3.6	05 16 S	104 15 W	100.0	175.0	
881117	01	07	01	07	01	5	64	2.0	05 10 S	107 39 W	100.0	57.0		
881118	01	04	02	02	01	3	69	0.2	04 54 S	110 23 W	100.0	49.0		
881118	02	06	03	03	10	12	4	55	0.2	04 44 S	110 51 W	100.0	310.0	
881118	03	01	04	04	08	11	03	64	1.3	04 42 S	110 53 W	100.0	13.0	
881118	06	01	08	01	06	02	06	4	3.1	04 34 S	111 34 W	100.0	23.0	
881119	01	05	02	05	02	06	4	69	0.2	04 06 S	113 17 W	100.0	133.0	
881122	01	02	01	02	01	4	31	0.0	02 26 S	122 50 W	100.0	62.0		
881123	02	18	06	06	02	4	31	0.4	02 06 S	128 59 W	100.0	52.0		
881123	03	05	03	03	06	03	69	2.7	00 25 N	124 26 W	100.0	93.0		
881125	04	02	04	07	01	3	69	0.0	00 37 N	124 31 W	100.0	54.0		
881125	05	01	05	08	01	3	55	5.0	00 39 N	124 30 W	100.0	47.0		
881125	07	02	07	08	03	4	56	2.2	01 13 N	124 39 W	100.0	47.0		
881125	07	02	07	08	03	4	55	4.8	04 17 N	124 30 W	100.0	39.0		
881126	07	01	09	07	02	3	55	0.8	06 13 N	124 18 W	100.0	80.0		
881126	07	02	01	01	03	4	69	0.4	12 35 N	122 49 W	100.0	62.0		
881127	01	03	01	03	02	5	69	2.6	13 44 N	122 34 W	100.0	16.0		
881129	02	03	01	03	02	5	69	2.6	13 44 N	122 34 W	100.0	15.0		
881129	06	17										13.0		

Table 3. (continued)

Sightings by Species												
species: STRIPED DOLPHIN (S. COERULEOALBA)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size est
Yrmody				number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)
										best	low	
881202	01	02	01	03	1	64	5.7	21 42 n	119 49 w	100.0	92.0	80.0
881202	06	03	04	02	1	69	4.2	22 30 n	119 08 w	100.0	27.0	24.0
881203	01	03	02	03	3	55	3.1	24 23 n	118 06 w	100.0	97.0	83.0
881203	02	02	03	02	3	64	1.5	24 28 n	117 58 w	100.0	155.0	138.0

Table 3. (continued)

Sightings by Species													
species: ROUGH-TOOTHED DOLPHIN (STENO BREDDANESIS)													
date	series	leg	sight	sun position	beauf.	detected	parp.	latitude	longitude	proportion	mean school size est		
Yrmody			number	horz.	vert.	number	by	dist. (km)	deg min	deg min (% of school)	best low		
880803	03	03	03	12	12	3	38	0.1	14 12 n	118 54 w	100.0 10.0		
880810	03	01	03	5	68	0.2	06 30 n	115 10 w	100.0 9.0		5.0		
880904	05	04	10	04	02	2	51	1.6	08 54 n	146 02 w	100.0 15.0		12.0
880914	04	01	04	5	38	0.0	04 22 n	117 41 w	100.0 100.0		16.0		13.0
881007			03	4	64	0.1	01 36 n	081 03 w	100.0 100.0		15.0		
881119	05	04	05	11	02	4	56	0.4	03 45 s	114 08 w	100.0 100.0		9.0
881121	04	01	04	08	01	1	67	1.0	02 37 s	120 17 w	98.3 123.0		11.0
881128	01	01	01	4	4	31	2.0	10 08 n	123 20 w	5.0 29.0		27.0	
881130	01	04	01	4	56	0.2	16 58 n	121 51 w	100.0 100.0		22.0		
881201	06	01	06	1	31	2.9	20 05 n	120 48 w	100.0 100.0		9.0 8.0		

Table 3. (continued)

sightings by species												
species: BOTTLENOSED DOLPHIN (TURSIOPS TRUNCATUS)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est
YMD			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best
											low	
880821	03	01	03	5	51	5.8	12	13 n	142 45 w	13.0	71.0	56.0
881024	04	02	06	09	01	0.0	01	09 s	090 58 w	92.0	135.0	100.0
881009	04	08	02	4	31	0.1	03	53 n	085 31 w	37.5	5.0	5.0
881013	04	04	04	04	55	0.9	01	42 n	091 56 w	100.0	100.0	75.0
881028	04	04	04	4	56	0.0	06	07 s	083 31 w	100.0	5.0	4.0
881029	01	08	01	4	56	1.9	08	12 s	082 18 w	8.3	21.0	19.0
881029	02	04	02	4	31	2.6	08	25 s	082 13 w	20.0	10.0	10.0
881029	07	03	09	4	67	0.6	08	58 s	083 03 w	30.0	30.0	2.0
881029	07	06	10	4	31	1.7	09	01 s	083 10 w	100.0	16.0	14.0
881108	01	01	01	4	64	1.7	11	43 s	079 08 w	100.0	17.0	15.0
881109	01	03	02	4	67	2.5	10	49 s	082 19 w	100.0	37.0	32.0
881109	02	01	03	4	69	0.3	10	48 s	082 24 w	100.0	66.0	56.0
881109	06	02	10	3	56	0.0	10	23 s	083 52 w	100.0	80.0	60.0
881110	07	01	14	4	31	1.0	09	33 s	085 52 w	100.0	10.0	8.0
881110	07	01	08	01	64	4.3	07	38 s	091 46 w	70.0	40.0	30.0
881112	01	08	01	4	69	0.1	05	56 s	098 29 w	50.0	35.0	31.0
881114	04	03	04	11	01	5	69	1.8	05 54 s	098 37 w	100.0	9.0
881114	05	03	05	11	01	55	0.5	09	33 s	085 52 w	100.0	20.0
881115	04	11	06	4	55	2.0	05	25 s	101 57 w	51.7	42.0	37.0
881119	02	02	04	3	67	1.4	03	58 s	113 36 w	67.5	37.0	32.0
881119	06	03	08	10	02	5	69	0.6	03 34 s	114 21 w	16.5	35.0
881120	02	21	02	10	01	4	67	2.2	02 50 s	117 23 w	4.7	44.0
881125	06	04	06	08	02	3	31	0.5	01 02 n	124 37 w	5.0	5.0
881128	01	01	01	4	31	2.0	10	08 n	123 20 w	10.0	29.0	27.0

Table 3. (continued)

Sightings by Species															
species: RISSO'S DOLPHIN (GRAMPUS GRISEUS)															
date	series	leg	sight	sun	position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size	est	
Yr	Mody			number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low	
880927	02	08	03	0.9	01	0.1	3	05	0.9	00 37 n	084 45 w	100.0	5.0	4.0	
881009	04	02	06	0.9	02	0.1	31	0.1	0.1	03 53 n	085 31 w	12.5	5.0	5.0	
881018	10	01	12	01	02	3	31	0.1	0.2	29 s	103 39 w	100.0	5.0	5.0	
881021	06	01	07	03	01	3	55	0.6	0.2	49 s	096 19 w	100.0	4.0	3.0	
881026	09	01	14	01	14	3	56	0.5	0.2	56 s	086 57 w	66.7	0.0*	42.0	
881027	05	02	05	1.0	01	3	64	0.3	0.3	16 s	085 21 w	75.0	4.0	4.0	
881029	04	02	04	0.4	04	4	67	1.1	0.8	38 s	082 31 w	100.0	9.0	7.0	
881030	01	10	01	05	01	5	55	0.1	10 44 s	085 29 w	100.0	5.0	5.0		
881109	03	10	04	11	01	3	64	0.9	10 33 s	083 16 w	100.0	8.0	8.0		
881110	05	09	12	4	55	0.7	0.7	0.9	10 s	086 47 w	100.0	12.0	10.0		
881110	07	01	14	4	31	1.0	0.9	0.9	10 s	086 57 w	30.0	40.0	30.0		
881111	01	02	01	3	55	3.2	0.8	51 s	088 15 w	100.0	8.0	7.0			
881111	02	04	02	4	31	0.6	0.6	0.8	46 s	088 36 w	100.0	5.0	5.0		
881111	03	02	03	4	56	0.0	0.0	0.8	42 s	088 47 w	100.0	8.0	7.0		
881112	05	05	05	4	64	0.2	0.2	0.7	21 s	092 52 w	100.0	3.0	3.0		
881115	03	01	04	4	56	1.5	0.5	34 s	101 09 w	100.0	47.0	37.0			
881121	01	02	01	2	56	1.3	0.2	34 s	119 35 w	100.0	28.0	24.0			
881121	02	03	02	07	02	1	64	2.2	0.2	36 s	119 49 w	100.0	3.0	3.0	
881121	02	04	03	07	02	2	69	3.2	0.2	36 s	119 55 w	100.0	16.0	13.0	
881121	04	01	04	08	01	1	67	1.0	0.2	37 s	120 17 w	1.7	123.0	115.0	
881121	05	02	05	09	01	2	31	0.4	0.2	38 s	120 25 w	100.0	11.0	10.0	
881127	05	05	05	3	55	0.2	0.6	43 n	124 04 w	100.0	4.0	4.0			
881127	07	03	06	3	31	1.2	0.7	03 n	123 58 w	100.0	50.0	44.0			
881201	06	01	05	1	31	0.6	0.6	20 03 n	120 50 w	100.0	2.0	2.0			

Table 3. (continued)

Sightings by Species											
species: PACIFIC WHITE-SIDED DOLPHIN (LAGENORHYNCHUS OBLIQUIDENS)											
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est
yr/mo/dy		number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best low
881204		02	03	02	3	31	4.8	27 37 n	115 00 w	60.0	250.0 225.0
881204		04	09	03	4	31	1.1	27 49 n	115 20 w	100.0	111.0 22.0

Table 3. (continued)

Sightings by Species												
species: DUSKY DOLPHIN (L. OBSCURUS) species code: 25												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est.
yr/mody	number	horz.	vert.	vert. number	by	dist. (km)	deg min	deg min	deg min	(% of school)	best	low
881107	01		4	31	0.9	12 02 s	077 22 w	100.0	100.0	7.0	6.0	

Table 3. (continued)

Sightings by Species												
species: FRASER'S DOLPHIN (LAGENODELPHIS HOSEI)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size est
yr\mo\dy				vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low
880808	01	03	01	05	02	3	38	5.7	04 43 n	119 18 w	100.0	749.0
881126	02	03	02	04	01	4	64	2.5	03 28 n	124 30 w	100.0	97.0
												82.0

Table 3. (continued)

Sightings by Species											
species: MELON-HEADED WHALE (PEPONOCEPHALA ELECTRA)											
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est
YMD	number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low
881007	01	01	01	3	31	2.4	01 28 n	081 00 w	100.0	242.0	187.0

Table 3 . (continued)

Sightings by Species												
species: PYGMY KILLER WHALE (FERESA ATTENUATA)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size est
Yrmody				number	vert.	number	dist. (km)	deg min	deg min	(% of school)	best	low
				horz.								
880821	03	01	03	01	3	51	5.8	12 13 n	142 45 w	8.0	71.0	56.0
881123	01	15	04	09	01	64	0.8	02 15 s	127 43 w	100.0	15.0	12.0

Table 3. (continued)

Sightings by Species											
species: FALSE KILLER WHALE (PSEUDORCA CRASSIDENS)											
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est
yr/mo/dy	number	vert.	horz.	vert. number	by	dist. (km)	deg min	deg min	(% of school)	best	low
880927	05		3	38	0.4	00	42 n	084 29 w	100.0	7.0	5.0

Table 3. (continued)

Sightings by Species												
species: PILOT WHALE (GLOBICEPHALA SP.)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est. low
Yrmcdy				number	horz.	vert.	number	by	dist.(km)	deg min	deg min (% of school)	best
880808	03	04	03	02	11	02	4	3	22	1.7	04 56 n	109 44 w
880815	03	05	02	04	10	02	4	70	0.9	13 06 n	127 45 w	100.0
880815	04	04	04	06	04	01	2	05	0.3	13 20 n	127 53 w	93.0
880904	04	13	06	07	07	02	4	68	1.1	09 05 n	146 09 w	100.0
880915	04	09	09	07	07	04	4	70	3.5	04 40 n	114 13 w	100.0
880916	07	01	05	01	05	04	4	70	0.7	04 57 n	111 34 w	53.3
880924								38	0.0	01 09 s	090 58 w	47.3
880924								38	0.0	02 30 s	103 39 w	3.0
881018	10	01	13	01	01	02	3	64	0.4	02 30 s	103 39 w	100.0
881022	04	01	03	10	01	04	4	55	0.2	05 00 s	096 01 w	100.0
881023	01	05	03	11	02	04	4	67	1.0	07 34 s	094 26 w	100.0
881023	03	08	05	04	01	04	4	69	0.0	08 14 s	093 55 w	100.0
881027	08	02	11	03	01	04	4	56	5.9	03 36 s	085 08 w	100.0
881027								56	1.9	08 12 s	082 18 w	100.0
881029	01	08	01	01	04	02	4	31	2.6	08 25 s	082 13 w	91.7
881029	02	04	02	04	02	03	4	67	0.6	08 58 s	083 03 w	80.0
881029	07	03	03	04	03	04	4	64	4.3	07 38 s	091 46 w	80.0
881112	01	08	01	06	01	04	4	64	4.3	05 54 s	098 37 w	70.0
881114	05	03	05	11	01	05	4	69	1.8	05 54 s	101 57 w	50.0
881115	04	11	06	06	04	02	3	55	2.0	05 25 s	082 13 w	50.0
881119	02	02	04	02	04	03	3	67	1.4	03 58 s	113 36 w	30.0
881119	06	03	08	10	02	05	5	69	0.6	03 34 s	114 21 w	30.0
881120	02	21	02	10	01	04	4	67	2.2	02 50 s	117 23 w	95.2
881120	05	02	05	10	03	03	3	64	5.2	02 28 s	117 55 w	44.0
881122	03	04	02	08	01	04	4	69	0.2	02 33 s	123 30 w	41.0
881126	07	01	08	07	02	08	3	56	1.5	04 17 n	124 30 w	12.0
											100.0	17.0
											100.0	0.0*
												6.0

Table 3. (continued)

Sightings by species													
species: KILLER WHALE (ORCINUS ORCA)													
date	series	leg	sight	sun	position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est.
yr/mo/dy			number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low
880813	04	03	02	04	01	03	05	68	0.4	09 39 n	122 02 w	100.0	3.0
880818	01	02	01	02	01	03	01	38	0.2	11 16 n	134 21 w	100.0	4.0
880821	02	07	01	07	01	03	01	38	2.0	12 11 n	142 20 w	100.0	2.0
880914	02	09	04	04	01	05	05	68	4.7	04 14 n	118 21 w	5.0	58.0
880927	04	04	04	04	06	01	01	05	1.4	00 41 n	084 35 w	5.7	75.0
881108	03	10	05	11	01	04	06	64	2.0	11 32 s	079 44 w	100.0	72.0
881109	03	11	05	11	01	03	01	31	0.6	10 33 s	083 16 w	100.0	11.0
881112	04	02	06	11	03	04	02	31	3.1	07 16 s	093 07 w	100.0	2.0
881120	03	04	03	10	01	03	03	31	2.0	02 44 s	117 36 w	100.0	13.0
												21.0	21.0

Table 3. (continued)

Sightings by Species

species: SPERM WHALE (PHYSETER MACROCEPHALUS)												species code: 46		
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est		
yr/mo/	mo	number	vert.	horz.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low		
880803	02	03	02	11	12	3	70	0.9	14 18 n	119 04 w	100.0	2.0		
880904		07	04	02	2	70	0.0	09 02 n	146 08 w	100.0	1.0	1.0		
880911		01	11	01	6	99	0.4	05 25 n	125 40 w	100.0	5.0	4.0		
881005	01	01	01	4	64	2.4	05 19 n	080 05 w	100.0	14.0	12.0			
881005	02	03	03	4	56	5.3	05 05 n	080 09 w	111.0	0.0*	62.0			
881021	08	01	09	03	01	4	4.5	02 54 s	096 17 w	100.0	7.0	5.0		
881027	12	01	14	03	02	3	55	03 46 s	084 58 w	100.0	5.0	5.0		
881107	01	01	14	03	02	4	64	2.4	11 32 s	079 46 w	100.0	96.0	87.0	
881108	04	04	05	06	01	4	69	0.7	11 20 s	080 21 w	100.0	4.0	4.0	
881108	05	07	07	4	69	6.3	09 50 s	085 22 w	100.0	1.0	1.0			
881110	01	04	01	06	02	3	69	6.3	09 50 s	085 22 w	100.0	1.0		
881110	01	06	02	06	02	4	67	5.9	09 48 s	085 29 w	100.0	5.0		
881116	01	02	01	02	5	64	6.4	05 16 s	103 56 w	100.0	1.0			
881116	01	04	02	4	55	6.3	05 16 s	104 05 w	100.0	2.0				
881116	02	08	04	11	01	4	31	3.3	05 06 s	105 04 w	100.0	4.0		
881117	03	03	11	01	4	69	0.2	05 01 s	108 44 w	100.0	1.0			
881118		07		4	31	0.4	04 34 s	111 33 w	100.0	5.0				
881118	01	04	01	02	4	31	2.6	04 54 s	110 18 w	100.0	17.0			
881119	06	01	06	10	02	4	31	2.3	03 40 s	114 14 w	100.0	3.0		
881119	06	02	07	10	02	4	31	2.4	03 37 s	114 18 w	100.0	13.0		
881119	07	01	09	10	03	5	55	0.2	03 33 s	114 27 w	100.0	0.0*		

Table 3. (continued)

Sightings by Species											
species: PYGMY SPERM WHALE (KOGIA BREVICEPS)											
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est
yr/mo/dy				number	horz.	vert. number	by	dist. (km)	deg min	deg min	(* of school) best low
880730	08	02	07	0		51	1.2	26 18 n	121 07 w	100.0	1.0

Table 3. (continued)

Sightings by Species												
species: DWARF SPERM WHALE (KOGIA SIMUS)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est.	
yr\mody				number	horz.	vert.	number	dist. (km)	deg min	deg min (% of school)	best low	
880816	01	07	01	2	38	0.4	13	25 n	129 19 w	100.0	1.0	
880816	05	01	05	2	05	1.5	12	56 n	130 26 w	10.0	10.0	
880910	04	01	06	11	01	1	38	1.1	07 45 n	128 25 w	100.0	3.0
880926	06	1.2	09	5	70	0.3	00 19 s	088 16 w	100.0	2.0	2.0	
881024	03	01	03	02	12	4	69	0.1	07 23 s	092 06 w	100.0	1.0
881111	04	06	05	11	01	4	55	0.0	08 27 s	089 30 w	100.0	1.0
881201	05	01	03	1	56	0.3	20 03 n	120 59 w	100.0	1.0	1.0	

Table 3. (continued)

Sightings by Species													
species: BEAKED WHALE (ZIPHIID)													
date	series	leg	sight	sun	position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yr\mody			number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best low	
880918			01	02	12	12	5	99	0.1	04 20 n	106 45 w	100.0 1.0 1.0	
880923	02	02	02	09	04	3	70	1.1	00 05 s	092 57 w	100.0 2.0 2.0		
881009	06	04	01	03	03	3	31	0.1	04 23 n	085 36 w	100.0 1.0 1.0		
881018	03	01	01	06	01	2	67	2.3	01 55 s	103 16 w	100.0 1.0 1.0		
881018	06	01	06	06	03	02	4	56	0.8	05 59 s	095 36 w	100.0 2.0 2.0	
881022	05	12	06	06	01	11	03	5	69	0.1	07 22 s	094 36 w	100.0 1.0 1.0
881023	01	02	01	05	06	04	02	4	69	0.6	08 28 s	093 45 w	100.0 1.0 1.0
881023	04	04	06	09	02	12	3	67	0.1	03 23 s	085 16 w	100.0 1.0 1.0	
881027	07	02	09	12	12	3	67	0.1	08 52 s	082 54 w	100.0 1.0 1.0		
881029	06	05	07	05	04	4	64	0.2	09 39 s	085 33 w	100.0 2.0 2.0		
881110	02	01	04	06	01	4	56	1.3	05 52 s	098 52 w	100.0 1.0 1.0		
881114	07	03	08	08	01	5	67	0.0	02 41 s	120 38 w	100.0 2.0 2.0		
881121	07	04	08	08	10	01	3	56	2.0	02 11 s	126 49 w	100.0 1.0 1.0	
881123	01	07	01	07	02	4	67	0.0	02 11 s	126 55 w	100.0 1.0 1.0		
881123	01	08	02	07	02	4	64	2.3	27 10 n	115 07 w	100.0 2.0 2.0		
881204			01			4	69	0.8					

Table 3. (continued)

Sightings by Species											
species: UNID. MESOPLODONT (MESOPLODON SP.)											
date	series	leg	sight number	sun position	beauf. vert.	detected	perp.	latitude dist. (km)	longitude deg min	proportion (# of school)	mean school size est
YMD											
880809	03	08	04	12	01	4	51	0.3	05 37 n	112 35 w	1.0
880809	04	03	05	12	01	4	51	0.1	05 42 n	112 46 w	1.0
880915							99	0.6	04 10 n	114 56 w	100.0
880928	02	01	02	12	3		05	1.0	02 10 n	082 22 w	100.0
881017	02	01	04		1		31	3.4	00 04 n	100 28 w	100.0
881017	08	01	11	01	3		56	2.5	00 26 s	101 06 w	100.0
881017	09	03	13	01	3		31	0.1	00 34 s	101 17 w	100.0
881020	03	01	03	12	02	4	69	0.3	02 50 s	099 24 w	100.0
881021				10			69	0.0	02 57 s	096 16 w	100.0
881023	02	03	04	10	01	4	69	0.1	07 47 s	094 15 w	100.0
881026	03	04	05	01	2		55	0.1	03 31 s	087 40 w	100.0
881026	06	01	10	07	02	2	67	0.0	03 06 s	087 12 w	100.0
881026	08	04	13		3		56	1.2	02 57 s	086 59 w	100.0
881029				05			04	1.7	08 38 s	082 32 w	100.0
881029	03	02	03				55	0.1	08 33 s	082 23 w	100.0
881108	02	03	02				31	0.0	11 38 s	079 23 w	100.0
881108	05	13	09				67	0.7	11 13 s	080 43 w	100.0
881109	05	02	08				31	0.0	10 26 s	083 44 w	100.0
881112	03	04	03				31	1.2	07 25 s	092 38 w	100.0
881115	01	02	01				55	2.7	05 43 s	100 35 w	100.0
881115	05	05	08				67	1.2	05 24 s	102 21 w	100.0
881120	04	05	04	10	02	3	64	0.6	02 30 s	117 52 w	100.0
881123	01	12	03	08	01	4	55	1.3	02 14 s	127 29 w	100.0

Table 3. (continued)

Sightings by Species													
species: CUVIER'S BEAKED WHALE (ZIPIHIUS CAVIROSTRIS)													
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est	
yr/mo/dy			number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	
											low	high	
881013	04	06	01		4	55	0.5	01 43 n	091 48 w	100.0	1.0	1.0	
881018	11	02	14	03	02	64	1.6	02 33 s	103 42 w	100.0	7.0	5.0	
881023	01	04	02	11	02	4	55	2.1	07 31 s	094 29 w	100.0	1.0	1.0
881026													
881027	07	02	08	12	12	3	04	0.1	03 17 s	087 24 w	100.0	2.0	2.0
881110	03	02	05		4	56	0.3	03 23 s	085 16 w	100.0	2.0	2.0	
881111	03	03	04	06	01	4	31	3.5	09 36 s	085 31 w	100.0	4.0	4.0
881111	05	04	07	10	03	4	67	0.7	08 40 s	088 55 w	100.0	5.0	5.0
881117	02	02	02		4	67	0.3	08 09 s	089 52 w	100.0	4.0	4.0	
881120	01	02	01		4	56	0.1	05 02 s	108 36 w	100.0	1.0	1.0	
881121						31	0.2	03 04 s	116 08 w	100.0	1.0	1.0	
881124	04	02	04	06	09	01	2	04	02 38 s	120 25 w	100.0	1.0	1.0
					01	64	0.5	00 57 s	126 02 w	100.0	3.0	3.0	

Table 3. (continued)

Sightings by Species													
species: RORQUAL (BALAENOPTERA SP.)													
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size est	
YMD				number	horz.	vert.	number	by	distr. (km)	deg min	deg min	(% of school)	
880731	05	07	04	04	02	3	05	3.4	23 11 n	120 0 w	100.0	1.0	
880808	04	05	04	05	12	01	4	3.8	05 03 n	109 59 w	100.0	1.0	
880810	05	03	05	10	01	4	70	0.3	06 35 n	115 28 w	100.0	1.0	
880903	02	11	01	01	11	01	4	70	10 1	11 57 n	148 41 w	100.0	1.0
880908	01	04	01	01	11	02	5	70	3.5	05 07 n	133 10 w	100.0	2.0
880909	01	07	01	07	12	02	4	68	0.3	03 33 n	131 22 w	100.0	1.0
880916	03	02	02	02	12	02	5	51	2.7	04 42 n	112 33 w	100.0	1.0
880916	08	02	06	02	06	06	5	2.1	04 57 n	111 20 w	100.0	1.0	
881009	03	01	03	01	12	01	01	31	1.2	04 01 n	084 53 w	100.0	1.0
881017	09	02	02	02	12	01	3	69	0.6	00 28 s	101 11 w	100.0	1.0
881021	04	01	04	01	12	01	2	64	1.7	02 49 s	096 30 w	100.0	1.0
881026	08	01	12	01	12	01	3	69	3.2	03 01 s	087 04 w	100.0	1.0
881027	10	02	13	02	13	01	3	69	3.1	03 42 s	085 01 w	100.0	1.0
881111	06	01	08	10	03	4	55	0.9	08 08 s	089 53 w	100.0	1.0	
881114	02	02	02	02	02	4	55	0.6	06 05 s	097 38 w	100.0	2.0	
881114	07	03	07	03	07	5	67	0.2	05 52 s	098 51 w	100.0	2.0	
881115	07	02	02	02	02	4	31	1.3	03 36 s	101 01 w	100.0	1.0	
881115	02	02	03	02	03	4	69	1.3	05 35 s	101 05 w	100.0	1.0	
881115	05	05	07	05	07	4	55	3.6	05 24 s	102 18 w	100.0	1.0	
881117	03	05	04	07	04	4	64	0.1	05 01 s	108 49 w	100.0	1.0	
881126	01	07	01	07	01	4	55	0.1	03 15 n	124 32 w	100.0	1.0	
881126	03	06	03	06	03	06	4	67	4.5	03 48 n	124 26 w	100.0	1.0
881126	03	06	04	06	04	06	55	0.1	03 48 n	124 26 w	100.0	1.0	
881128	03	02	03	02	02	5	31	1.6	10 14 n	123 19 w	100.0	1.0	
881128	03	03	04	08	02	4	67	5.6	10 22 n	123 19 w	100.0	1.0	
881128	03	13	02	05	01	2	55	1.0	10 24 n	123 18 w	100.0	1.0	
881201	02	13	02	05	01	2	31	3.1	19 39 n	121 07 w	100.0	1.0	

Table 3. (continued)

Sightings by Species												
species: MINKE WHALE (B.ACUTOROSTRATA)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est
yr\mo\dy		number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low
881203	03	03	04	04	02	3	64	0.5	24 38 n	117 53 w	100.0	1.0

Table 3. (continued)

Sightings by Species													
species code: 72													
species: BRYDE'S WHALE (B. EDENI)													
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est	
yr/mo/dy		number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low	
880907		02	05	12	3	6	38	0.2	04 59 n	137 18 w	100.0	1.0	
880923	05	02	05	12	3	22	0.3	00 14 s	092 56 w	100.0	5.0	5.0	
881020	08	01	08	06	01	4	55	0.3	02 44 s	098 38 w	100.0	2.0	2.0
881028			03		4	4	04	0.6	05 59 s	083 37 w	100.0	2.0	2.0
881111	04	07	06	11	01	4	55	1.7	08 24 s	089 40 w	100.0	1.0	1.0
881117	04	05	05	05	4	67	0.6	05 02 s	109 07 w	100.0	1.0	1.0	
881129	05	05	02	06	01	4	64	0.6	13 02 n	122 40 w	100.0	2.0	2.0

Table 3. (continued)

Sightings by Species											
species: BLUE WHALE (B. MUSCULUS)											
date	series	leg	sight	sun	position	beauf.	detected	perp.	latitude	longitude	proportion
yr/mody	number	horz.	vert.	number	by	dist.	(km)	deg min	deg min	(% of school)	mean school size est
										best	low
881021	07	02	08	03	01	4	67	3.3	02 52 s	096 19 w	100.0
											5.0
											5.0

Table 3. (continued)

Sightings by species												
species: HUMPBACK WHALE (MEGAPTERA NOVAEANGLIAE)												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size	est
yr/mo/dy			number	vert.	horz.	number	by	dist. (km)	deg min	deg min	(% of school)	low
881021	05	02	06	04	12	3	56	0.9	02 46 S	096 23 W	100.0	2.0
			03	04	4		04	1.6	27 43 N	115 08 W	100.0	2.0
881204			05		4	31	0.0	27 49 N	115 20 W	100.0	2.0	2.0
881204												

Table 3. (continued)

Sightings by Species														
species: UNIDENTIFIED DOLPHIN														
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size est		
ymd							dist.(km)	deg min	deg min	(% of school)	best	low		
number	horz.	vert.												
880730	07	01	06	0	51	8.8	26 26 n	121 10 w	100.0	0.0*	2.0			
880731	06	02	05	3	70	7.8	23 02 n	119 57 w	100.0	0.0*	2.0			
880801	04	05	03	4	51	1.2	19 36 n	118 56 w	100.0	0.0*	1.0			
880803	01	12	01	4	38	1.0	14 23 n	119 17 w	100.0	0.0*	4.0			
880803	03	04	04	06	01	3	38	14 08 n	118 44 w	100.0	0.0*	1.0		
880803	03	09	05	3	38	0.5	13 56 n	118 16 w	100.0	0.0*	3.0			
880803	04	01	06	3	68	0.5	13 56 n	118 13 w	100.0	0.0*	18.0			
880804	03	01	02	3	70	0.4	11 47 n	116 14 w	100.0	0.0*	1.0			
880805	01	04	01	2	05	6.4	11 10 n	115 04 w	100.0	0.0*	1.0			
880805	03	08	03	05	51	3.0	05 11 n	109 02 w	100.0	0.0*	1.0			
880807	03	08	03	05	51	2.2	1.1	05 01 n	110 20 w	100.0	0.0*	1.0		
880808	05	06	05	01	03	3.8	3.7	05 21 n	112 01 w	100.0	0.0*	11.0		
880809	02	01	03	02	05	68	0.1	06 29 n	115 06 w	100.0	0.0*	3.0		
880810	02	02	04	01	11	0.2	50	0.8	07 44 n	118 20 w	100.0	0.0*	20.0	
880811	02	04	01	01	01	68	0.9	09 38 n	122 01 w	100.0	0.0*	5.0		
880813	01	01	01	01	04	10	02	70	0.3	13 20 n	127 53 w	7.0		
880815	04	04	04	10	02	05	6.8	12 55 n	130 27 w	100.0	0.0*	4.0		
880816	03	09	03	02	02	70	0.4	12 53 n	130 12 w	100.0	0.0*	1.0		
880816	06	01	07	02	02	68	0.6	12 11 n	142 21 w	100.0	0.0*	7.0		
880821	01	02	02	03	51	5.8	12 13 n	142 45 w	79.0	71.0	56.0			
880821	03	01	03	03	51	1.8	11 54 n	143 28 w	100.0	0.0*	4.0			
880822	02	04	01	02	10	0.1	3.0	12 22 n	143 40 w	100.0	0.0*	1.0		
880822	03	04	03	04	04	51	0.9	12 48 w	143 51 w	100.0	0.0*	10.0		
880822	03	04	03	04	04	70	0.5	10 57 n	148 02 w	100.0	0.0*	2.0		
880903	05	04	03	04	03	38	0.8	11 11 n	148 08 w	100.0	0.0*	3.0		
880903	06	01	05	04	01	38	3.5	10 52 n	147 58 w	100.0	0.0*	4.0		
880904	04	09	05	04	02	68	5.9	09 19 n	146 19 w	100.0	0.0*	52.0		
880904	05	04	09	04	03	51	1.2	08 54 n	146 03 w	100.0	0.0*	1.0		
880906	03	04	03	04	03	99	0.0	05 58 n	141 20 w	100.0	0.0*	4.0		
880910	02	03	02	03	02	70	1.4	07 48 n	128 48 w	100.0	0.0*	30.0		
880914	02	07	01	02	05	68	4.7	04 14 n	118 21 w	15.7	77.0	58.0		
880914	03	04	02	01	11	03	5	0.4	04 17 n	118 04 w	100.0	0.0*	1.0	
880915	01	03	01	12	01	38	0.1	04 35 n	115 40 w	100.0	0.0*	1.0		
880915	02	06	03	12	01	50	4.1	04 33 n	115 23 w	100.0	0.0*	1.0		
880915	02	06	04	12	01	5	5.7	04 33 n	115 23 w	100.0	0.0*	9.0		
880915	02	06	04	07	07	68	3.5	04 40 n	114 13 w	13.3	13.0	12.0		
880916	03	02	01	12	02	4	51	0.7	04 47 n	112 34 w	100.0	0.0*	3.0	
880916	07	01	05	4	70	0.7	04 57 n	111 34 w	19.3	3.0	3.0			
880918	03	02	02	5	38	2.9	04 20 n	106 41 w	100.0	0.0*	3.0			
880919	04	06	03	5	38	2.7	03 36 n	101 55 w	100.0	0.0*	2.0			
880923	04	01	04	12	3	70	0.8	00 49 s	092 57 w	100.0	0.0*	50.0		
880923	08	01	04	06	03	51	3.7	00 47 s	092 34 w	100.0	0.0*	200.0		

Table 3. (continued)

Sightings by Species												
species: UNIDENTIFIED DOLPHIN												
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yr\mo\dy			number	horz.	vert.	number	by	dist. (km)	deg min	(% of school)	best	
880926	01	04	01	5	4	05	0.2	01 03 s	088 39 w	100.0	23.0	
880927	01	01	01	58	51	02	2.2	00 17 n	085 33 w	100.0	0.0*	
880928	01	01	07	51	51	02	1.8	02 50 n	082 04 w	100.0	0.0*	
880928	01	01	01	70	70	02	2.4	02 07 n	082 25 w	100.0	0.0*	
880928	03	01	04	4	38	02	4.1	02 18 n	082 16 w	100.0	0.0*	
880928	03	01	05	51	51	02	5.9	02 19 n	082 16 w	100.0	5.0	
880928	06	04	11	09	70	03	1.5	03 47 n	081 38 w	100.0	0.0*	
881007	04	11	05	4	55	07	0.7	02 12 n	081 28 w	100.0	1.0	
881008	01	02	01	4	67	03	57	03 57 n	082 32 w	100.0	0.0*	
881008	02	01	02	5	31	04	3.9	04 04 n	084 51 w	100.0	2.0	
881009	05	03	08	4	55	1.5	04 14 n	085 34 w	100.0	0.0*		
881010	02	01	02	4	67	0.6	06 47 n	086 04 w	100.0	0.0*		
881010	02	01	01	4	67	0.6	06 46 n	086 04 w	100.0	0.0*		
881014	06	01	03	5	64	0.8	02 43 n	093 44 w	100.0	1.0		
881014	07	01	04	31	83	0.2	02 45 n	093 45 w	100.0	60.0		
881015	03	08	01	09	01	55	7.9	03 30 n	095 44 w	100.0	0.0*	
881016	01	07	01	4	64	0.5	01 06 n	098 57 w	100.0	1.0		
881017	01	01	02	1	69	4.1	00 04 n	100 18 w	100.0	40.0		
881017	02	01	03	1	31	6.2	00 23 n	100 07 w	100.0	20.0		
881017	06	01	09	2	31	6.5	00 21 s	100 48 w	100.0	1.0		
881018	01	05	01	3	55	1.2	01 39 s	102 52 w	100.0	0.0*		
881018	07	01	08	12	31	7.9	01 59 s	103 21 w	100.0	0.0*		
881018	08	01	10	01	67	0.4	02 13 s	103 26 w	100.0	7.0		
881019	01	01	02	3	69	4.0	02 59 s	102 26 w	100.0	0.0*		
881019	06	01	09	2	31	6.5	00 23 n	101 07 w	100.0	0.0*		
881019	06	01	09	3	55	1.2	01 39 s	102 52 w	100.0	1.0		
881021	10	01	12	03	64	0.5	03 13 s	096 18 w	100.0	60.0		
881022	01	04	01	10	69	2.4	04 40 s	096 00 w	100.0	3.0		
881026	01	02	01	3	56	8.5	03 54 s	088 02 w	100.0	0.0*		
881026	02	01	03	2	31	0.9	03 41 s	087 51 w	100.0	1.0		
881026	09	01	16	03	4	55	0.5	02 56 s	086 57 w	33.3	0.0*	
881027	02	01	02	10	02	3	55	0.1	03 03 s	085 28 w	100.0	2.0
881027	05	02	05	10	01	64	0.3	03 16 s	085 21 w	25.0	4.0	
881027	07	01	07	11	01	31	6.2	03 21 s	085 17 w	100.0	2.0	
881028	02	01	03	3	64	0.4	05 09 s	084 10 w	100.0	3.0		
881028	09	01	14	14	02	12	4	69	03 53 s	083 39 w	100.0	2.0
881028	02	03	08	02	02	12	4	67	1.8	08 56 s	082 58 w	
881108	03	03	03	06	01	4	55	0.5	11 35 s	079 33 w	100.0	0.0*
881109	01	02	01	4	56	3.0	10 50 s	082 11 w	100.0	0.0*		
881109	06	01	09	3	64	3.7	05 09 s	083 24 s	083 45 w	100.0	1.0	
881110	05	07	10	4	55	5.8	09 13 s	086 37 w	100.0	0.0*		
881110	05	08	11	4	56	1.5	09 11 s	086 43 w	100.0	3.0		
881112	02	10	02	4	69	0.9	07 30 s	092 21 w	100.0	1.0		
881118	04	01	05	5	31	4.2	04 42 s	110 58 w	100.0	3.0		

Table 3. (continued)

Sightings by Species											
species: UNIDENTIFIED DOLPHIN											
date	series	leg	sight	sun position	beauf.	detected	perp.	latitude	longitude	proportion	mean school size est
Yrmody			number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)
										best	low
881119	01	01	01	06	03	4	55	7.0	04 12 S	112 56 W	100.0
881122	04	06	03	09	01	4	55	0.3	02 26 S	123 55 W	100.0
881127	02	01	02	01	02	3	55	6.6	06 18 n	124 15 W	100.0
881127	02	02	03	02	03	3	69	5.1	06 18 n	124 15 W	100.0
881127	03	01	04	01	07	3	69	3.4	06 22 n	124 14 W	100.0
881127	08	08	01	07	09	3	31	0.4	07 07 n	123 57 W	100.0
881127	09	03	09	03	09	3	56	5.6	07 13 n	123 59 W	100.0
881128	01	01	01	01	01	4	31	2.0	10 08 n	123 20 W	85.0
881202	02	02	02	03	02	1	55	7.2	21 51 n	119 39 W	100.0
881203	01	02	01	03	03	3	56	7.3	24 20 n	118 08 W	100.0
881203	05	05	05	06	02	3	67	6.5	25 16 n	117 30 W	100.0
											0.0*
											2.0
											1.0
											0.0*
											10.0
											0.0*
											1.0
											1.0
											15.0
											15.0
											6.0
											6.0
											0.0*
											1.0
											27.0
											29.0
											27.0
											2.0
											2.0
											50.0
											50.0
											30.0

Table 3. (continued)

Sightings by Species											
species: UNIDENTIFIED SMALL WHALE											
date	series	leg	sight number	sun horz.	position vert.	beauf. number	detected by	perp. dist. (km)	latitude deg min	longitude deg min	proportion (% of school)
yr\mo\dy											
880730	06	05	05	01	01	1	68	0.0	26 29 n	121 11 w	100.0
880816	07	01	08	01	02	2	05	0.6	12 53 n	130 33 w	100.0
880906	03	01	01	02	03	4	38	0.0	05 58 n	141 20 w	100.0
880920	02	03	01	01	01	5	51	0.1	03 35 n	100 00 w	100.0
880926	07	05	07	01	07	5	99	0.1	00 28 s	087 42 w	100.0
880927	03	05	06	01	07	3	70	0.3	00 49 n	084 05 w	100.0
880927	03	09	07	01	07	3	38	0.3	00 53 n	083 55 w	100.0
881022	05	03	04	04	12	4	31	2.0	05 11 s	095 57 w	100.0
881029	06	05	06	06	06	4	69	0.0	08 51 s	082 52 w	100.0
881108	05	06	06	08	08	4	31	0.5	11 21 s	080 17 w	100.0
881108	05	08	08	08	08	4	69	0.7	11 17 s	080 30 w	100.0
881116	02	09	05	11	01	5	31	0.4	05 06 s	105 06 w	100.0
881119	02	01	03	01	03	3	69	1.2	04 00 s	113 25 w	100.0
881121	06	01	07	09	01	2	69	2.5	02 39 s	120 25 w	100.0
881123	02	01	05	10	01	4	31	1.9	02 15 s	127 45 w	100.0
881124	01	08	01	01	02	5	55	0.4	01 16 s	126 39 w	100.0
881124	02	03	02	02	01	5	69	4.6	01 14 s	126 33 w	100.0
881127	09	02	08	07	01	3	67	0.1	07 10 n	123 59 w	100.0

species code: 78

Table 3. (continued)

Sightings by Species											
species: UNIDENTIFIED LARGE WHALE											
date	series	leg	sight	sun	position	beauf.	detected	perp.	latitude	longitude	proportion
YMD											
number	horz.	vert.	number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)
880809	01	01	01	01	12	01	3	68	0.4	05 15 n	111 29 w
880810	06	06	06	07	11	01	4	22	0.5	06 36 n	115 28 w
880810	06	04	07	07	01	5	38	0.0	0.0	06 42 n	115 36 w
880814	01	06	01	06	01	5	68	4.9	11 03 n	124 31 w	100.0
881113	01	01	01	01	4	4	67	6.4	06 58 s	094 17 w	100.0
881115	04	03	05	08	12	4	69	3.2	05 30 s	101 23 w	100.0
881115	06	02	09	02	09	4	55	7.9	05 23 s	102 28 w	100.0
881118	05	08	06	11	03	4	64	4.3	04 33 s	111 31 w	100.0
											1.0

Table 3. (continued)

Sightings by Species													
species: UNIDENTIFIED CETACEAN													
date	series	leg	sight	sun	position	beauf.	detected	perp.	latitude	longitude	proportion	mean	school size est
yr/mo/			number	horz.	vert.	number	by	dist. (km)	deg min	deg min	(% of school)	best	low
880906	01	04	01	11	03	3	70	0.0	06 06 n	141 35 w	100.0	0.0*	1.0
880910	01	02	01	02	03	1	70	0.7	07 48 n	128 48 w	100.0	1.0	1.0
881015	02	01	02	11	03	5	38	2.4	04 34 n	115 39 w	100.0	0.0*	1.0
881019	01	01	01	01	01	3	69	0.7	02 59 s	102 29 w	100.0	1.0	1.0
881020	01	01	01	01	01	3	55	2.3	02 57 s	099 37 w	100.0	2.0	2.0
881024	01	03	01	01	03	4	55	8.3	07 43 s	092 36 w	100.0	0.0*	2.0
881024	01	09	02	01	01	4	55	0.7	07 29 s	092 18 w	100.0	1.0	1.0
881026	04	03	07	03	02	2	56	3.1	03 13 s	087 20 w	100.0	1.0	1.0
881109	03	12	06	11	01	3	56	0.7	10 29 s	083 30 w	100.0	1.0	1.0
881109	04	02	07	07	01	3	56	0.0	10 27 s	083 37 w	100.0	2.0	2.0
881110	05	05	09	11	01	3	64	1.3	09 15 s	086 32 w	100.0	1.0	1.0
881114	06	01	06	11	01	5	55	0.1	05 54 s	098 43 w	100.0	0.0*	1.0
881123	04	04	01	07	01	4	55	0.0	02 00 s	127 52 w	100.0	0.0*	1.0
881126	05	03	06	3	64	0.7	04 04 n	124 30 w	100.0	1.0	1.0		

Sightings by Species

species: UNIDENTIFIED WHALE

species code: 98

date	series	leg	sight number	sun horz.	position vert.	beauf. number	detected by	perp. dist. (km)	latitude deg min	longitude deg min	proportion (% of school)		mean best	school size est
											low	high		
880731	05	01	03	02	05	01	01	05	6.2	23 39 n	120 10 w	100.0	1.0	1.0
880807	03	01	02	01	03	01	03	38	2.8	05 46 n	109 25 w	100.0	1.0	1.0
880811	03	04	02	04	02	11	03	51	0.1	08 00 n	118 36 w	100.0	1.0	1.0
880813	03	01	04	01	04	03	05	70	0.1	10 07 n	122 37 w	100.0	1.0	1.0
880815	04	07	04	03	03	12	12	51	0.0	13 07 n	127 44 w	100.0	1.0	1.0
880904	04	03	06	06	01	06	01	68	2.3	09 20 n	146 23 w	100.0	1.0	1.0
880915	04	03	03	03	01	02	02	58	1.0	04 40 n	114 39 w	100.0	0.0*	1.0
880926	04	07	04	01	01	04	01	38	1.4	00 59 s	088 32 w	100.0	1.0	1.0
880926	04	06	04	05	06	05	01	70	0.5	00 48 s	088 21 w	100.0	0.0*	3.0
880926	06	07	08	05	07	08	08	68	0.1	00 33 s	087 54 w	100.0	2.0	1.0
880927	02	04	02	04	02	04	04	70	0.0	00 26 s	087 27 w	100.0	1.0	1.0
880928	04	11	08	03	11	08	03	51	0.9	00 28 n	085 10 w	100.0	1.0	1.0
881008	03	14	04	11	02	04	11	69	7.9	02 51 n	082 04 w	100.0	1.0	1.0
881009	01	02	01	05	01	02	01	69	0.4	04 56 n	083 16 w	100.0	1.0	1.0
881009	03	06	04	05	05	06	04	69	0.2	04 06 n	084 49 w	100.0	3.0	3.0
881010	03	07	05	06	05	05	05	31	3.6	03 44 n	085 12 w	100.0	1.0	1.0
881010	03	07	03	07	03	07	03	56	1.4	06 52 n	086 24 w	100.0	1.0	1.0
881014	08	08	07	07	03	05	05	55	5.6	07 03 n	086 13 w	100.0	0.0*	0.0*
881020	09	06	09	05	02	04	01	64	0.2	03 06 n	093 57 w	100.0	1.0	1.0
881026	03	04	04	04	01	02	01	67	1.3	02 44 s	098 29 w	100.0	1.0	1.0
881124	04	01	03	06	01	03	06	69	5.2	03 32 s	087 41 w	100.0	2.0	2.0
								00	58 s	00 58 s	126 03 w	100.0	1.0	

Table 4. Marine mammal school size estimates for each observer, classified by species code, for all sightings encountered in the eastern tropical Pacific during July through September (Part A) and October through December (Part B), 1988.

A. Sightings encountered July through September 1988.

date	sight no.	obs 5			obs 22			obs 38			obs 51			obs 68			obs 70			
		best	pct	est.	best	pct	est.	best	pct	est.	best	pct	est.	best	pct	est.	best	pct	est.	
		obs	5	best	pct	est.	obs	22	best	pct	est.	obs	38	best	pct	est.	obs	51	best	pct
species	2	880730	03	75	100	65	100	70	100	125	100	130	100	50	100	880730	04	75	100	150
										300	100	240	100							300
		880731	02	75	100	65	100	75	100	85	100	61	100	40	100	880801	02	75	100	200
										400	100	156	100	225	100					100
		880802	01	85	100	100	100	125	100	130	100	108	100			880803	07	85	100	125
										90	40	96	20							70
		880810	01	225	80	50	100	125	60	65	70	100	70			880810	08	225	80	200
										20	100	230	100	200	100					100
		880816	04	350	10	350	7	250	20	250	70	330	60			880818	01	350	10	115
										20	100	150	80	120	50					150
		880918	02	880904	02	350	40	160	50	180	25	300	40			880904	03	350	40	150
										150	45	230	40	320	60					40
		880909	02	880914	01	880914	03	880916	03	70	88	40	75	120	75			880914	03	880916
										90	25	70	15	140	75					75
		880916	04	350	80	100	100	100	100	100	100	200	100			880919	02	880919	02	100
																			100	
species	5	880730	01	20	100	35	100	75	100	90	60	96	80			880804	01	75	100	340
										100									100	
		880923	03	550	100	340	100													
species	10	880803	07													880810	01	225		
																			20	
		880815	01																100	
		880816	02																100	
		880816	04																100	
		880816	09																100	
		880817	01																100	
		880817	02																100	
		880817	03																100	
		880817	04																100	
		880818	01																100	
		880818	06																100	
		880822	04																100	
		880903	02																100	
		880904	01																100	
		880904	02																100	
		880904	03																100	

Table 4A. (continued)

date	sight no.	obs 5		obs 22		obs 38		obs 51		obs 68		obs 70		
		best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	
species 11	880909	02	350	60	160	50	150	55	230	60	320	40	275	45
	880914	03	880916	03	880916	04	350	20	90	75	70	85	140	25
	880916	04					175	50						
species 13	880730	02	27	100	17	100	45	100	55	100	30	100	35	100
	880731	01	20	100	2	100	20	100	15	100	34	100	25	100
	880801	01	2	100	25	100	15	100	40	100	24	100	2	100
	880807	01					40	100	40	100	96	100		
species 15	880808	02					20	100	20	100	32	100		
	880809	02					40	100	40	100				
	880810	04					20	100	20	100				
	880813	03					30	100	28	100	77	100		
species 17	880816	05	10	90			30	100	30	100				
	880816	10					25	100	25	100				
	880816	11	30	100	60	70	45	66	66	100			50	100
	880817	04	200	100	75	100	90	100	68	100	130	100	100	80
species 19	880818	03					27	100	33	100	43	100	125	100
	880818	05					20	100	20	100	43	100	225	100
	880910	02	200	100			60	100	60	100	110	100		
	880910	04					60	100	100	100	110	100		
species 21	880910	05	20	100	6	100	60	100	40	100	135	100	10	100
	880910	07					60	100	100	100	110	100		
	880910	08					60	100	70	100	155	100		
	880910	09					75	100	32	100	38	100		
species 23	880919	01												
	880926	02	50	100	60	100	75	99	70	100	6	100	75	100
	880926	05					75	100	75	100	12	100		
	880927	04					75	100	70	100	38	100		
species 25	880927	04												
	880928	03												
	880928	06												
	880928	10												
species 27	880928	10												
	880930	03	6	100	6	100	12	100	12	100	9	100	14	100
	880930	03					12	100	12	100	17	100	7	100
	880930	10					22	100	22	100	10	100	14	100
species 29	880934	04												
	880934	04												
	880934	18											71	13
	880934	21	880927	03	5	100								
species 31	880934	26	880908	01	600	100	850	100	600	100	1700	100	395	100
	880934	26											350	100

Table 4A. (continued)

date	sight no.	obs 5			obs 22			obs 38			obs 51			obs 68			obs 70				
		best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct		
species	32	880821	03																71	8	
species	34	880808	03	24	100	4	100	17	100	15	100	15	100	10	100	10	100	16	94	15	100
	880815	02	23	96	10	100	10	90	13	92	15	100	15	100	16	94	15	100	16	94	
	880815	04	18	100																	
	880904	06																			
	880915	07																			
	880916	05	3	67																	
species	37	880818	04																		
	880821	01																			
	880914	01																			
	880927	04																			
species	46	880803	02	2	100	2	100	2	100	2	100	2	100	2	100	2	100	2	100	2	100
species	47	880730	07																		
species	48	880816	01																		
	880816	05	10	10																	
	880910	06																			
	880926	09																			
species	49	880923	02	2	100																
species	51	880809	04																		
	880809	05																			
	880928	02	3	100																	
species	70	880731	04	1	100																
	880808	04																			
	880810	05																			
	880903	01																			
	880908	01	2	100																	
	880909	01	1	100																	
	880916	02																			
species	72	880923	05	5	100																

Table 4A. (continued)

	date	sight no.	obs best est.	5 pct	obs best est.	22 pct	obs best est.	38 pct	obs best est.	51 pct	obs best est.	68 pct	obs best est.	70 pct
species 77														
	880809	03												
	880813	01												
	880815	04												
	880821	02												
	880821	03												
	880822	02												
	880822	03												
	880914	01												
	880914	07												
	880915	07												
	880916	01												
	880916	05												
	880916	06												
	880923	01												
	880926	15												
	880928	05												
species 78														
	880730	05												
	880920	01												
	880927	06												
	880927	07												
species 79														
	880809	01												
	880810	06												
	880810	07												
	880814	01												
species 96														
	880910	01												
species 98														
	880731	03												
	880807	02												
	880811	02												
	880813	04												
	880904	04												
	880926	06												
	880926	08												
	880927	02												
	880928	08												

Table 4B. Sightings encountered October through December, 1988.

date	sight no.	obs 4		obs 12		obs 31		obs 55		obs 56		obs 64		obs 67		obs 69	
		best est.	pct														
		species															
881014	01	881014	01	110	95	300	40	250	20	80	92	325	35	550	98		
881014	02	881014	02	40	100	1600	20	800	3	1050	15	525	5	50	100		
881014	06	881020	02	480	5	165	75	500	100	360	100	195	8	300	100	225	90
881110	06	881110	06	881110	08	500	100	360	100	375	100	260	100	160	1	380	100
881116	03	881116	03	480	100	110	100	300	100	350	100	220	100	120	100		
881125	01	881125	02	480	100	170	75	180	80	350	100	180	100	215	80	1600	99
881126	05	881126	05	1240	98	145	100	350	100	180	100	220	100	120	100		
881126	07	881201	01	68	100	160	100	160	100	160	100	160	100	80	100		
881201	04	881202	03	65	100												
95	species	881014	01	110	5											550	2
5	species	881008	03	881010	04	650	100	200	100	50	100	750	100	1400	100		
		881017	01	881017	05	400	100	800	100	400	100	600	100	1400	100		
		881017	06	881017	08	70	100	40	100	70	100	105	100	90	100		
		881017	14	881017	15	6	100	35	100	75	100	14	100	9	100		
		881017	15	881017	16	290	100	70	100	100	100	400	100	450	100		
		881018	02	881018	05	16	100	70	100	125	100	30	100	70	100	40	100
		881018	09	881018	15	5	100	75	100	225	100	5	100	325	100	6	100
		881020	07	881021	03	360	100	175	100	250	100	500	100	225	100	360	100
		881021	05	881026	02	2850	100	2100	100	3000	100	2200	100	1850	100	3300	100
		881027	01	881027	03	14	100	10	100	1100	99	22	100	22	100	30	100
		881027	04	881027	12	10	100	110	100	1100	98	8	100	1300	98	9	100
		881027	15	881110	03	1150	100	1400	100	1200	100	1400	100	1350	100	1800	99
		881027	15	881110	03	500	100	400	100	450	100	1200	100	600	100	2700	100
		881027	15	881110	03	3150	100	3500	100	200	100	2300	100	375	100	110	100
		881110	03			350	100					220	100	5200	100		

Table 4B. (continued)

		obs 4	obs 12	obs 31	obs 55	obs 56	obs 64	obs 67	obs 69	
	date	sight no.	best est.	pct	best est.	pct	best est.	pct	best est.	
species 10	881014	02			300	60	250	80	325	65
species 11	881020	02			480	95	1600	80	800	97
	881110	06			165	25			1050	85
	881116	03							195	75
	881118	03							210	50
	881126	05							215	20
	881126	07							1600	1
species 13	881005	02								
	881007	02								
	881007	04								
	881007	06								
	881008	02								
	881008	05								
	881009	05								
	881009	07								
	881013	03								
	881014	05								
	881017	07								
	881017	10								
	881018	04								
	881018	07								
	881018	11								
	881019	04								
	881020	04								
	881020	05								
	881020	06								
	881020	10								
	881021	01								
	881021	02								
	881021	11								
	881022	02								
	881022	05								
	881024	04								
	881026	02								
	881026	08								
	881026	09								
	881026	11								
	881027	06								
	881027	10								
	881110	13								
	881112	04								
	881113	02								
	881113	03								
	881114	01								
	881114	03								

Table 4B. (continued)

date	sight no.	obs 4		obs 12		obs 31		obs 55		obs 56		obs 64		obs 67		obs 69	
		best est.	pct														
species 13	881114	09				45	100			95	100			75	100		
	881116	03				45	100			195	17			160	20		
	881117	01				60	100	450	35	400	40	13	100	65	100	60	100
	881118	02						50	100	50	100	42	100	210	50	40	100
	881118	03								200	100			30	100		
	881118	04												100	100		
	881118	08															
	881119	02															
	881122	01															
	881123	06															
	881125	03															
	881125	04															
	881125	05															
	881125	07															
	881125	09															
	881127	01															
	881129	03															
	881202	01															
	881202	04															
	881203	02															
	881203	03															
species 15	881119	05															
	881121	04															
	881130	01															
	881201	06															
species 18	881009	06															
	881013	02															
	881028	04															
	881029	01															
	881029	02															
	881029	09															
	881029	10															
	881108	01															
	881109	02															
	881109	03															
	881109	10															
	881110	14															
	881112	01															
	881114	04															
	881114	05															
	881115	06															
	881119	04															
	881119	08															
	881120	02															

Table 4B. (continued)

	date	obs 4			obs 12			obs 31			obs 55			obs 56			obs 64			obs 67			
		sight no.	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	
species 18	881125	06						4	100								6	100					
species 21	881009	06	881018	12	881021	07	881027	05	881029	04	881030	01	881109	04	881110	12	881110	14	881111	01	881111	02	
																	5	100	3	100	10	100	
																	5	100	5	100	4	100	
																	8	100	11	100	14	100	
																	40	30	8	100	8	100	
																	8	100	35	100	30	100	
																	9	100	7	100	60	100	
																	11	100	35	100	30	100	
																	11	100	11	100	11	100	
																	8	100	160	1	100	2	100
																	8	100	4	100	34	100	
																	65	100	2	100	105	100	
species 26	881126	02																105	100	105	100	80	100
species 31	881007	01																300	100	300	100	300	100
species 32	881123	04															9	100	25	100	12	100	
species 34	881018	13	881023	03	881023	05	881027	11	881029	01	881029	02	881029	09	881112	01	881112	05	881114	05	881115	06	
																	8	100	27	90	20	90	
																	10	80	30	70	42	45	
																	33	45	40	35	45	45	
																	12	25	45	25	40	40	
																	43	95	37	95	50	96	
																	14	100	14	100	45	95	
																					12	100	

Table 4B. (continued)

	date	sight no.	obs 4			obs 12			obs 31			obs 55			obs 64			obs 67			
			best pct	est.	est.																
species 34	881122	02																22	100	13	100
species 37	881108	04							10	100	17	100						11	100	11	100
	881109	05							2	100								2	100	2	100
	881112	06							15	100	20	100						10	100	10	100
	881120	03							21	100											
species 46	881021	09																7	100		
	881027	14																135	100	110	100
	881108	05																60	100	4	100
	881108	07																		1	100
	881110	01																			
	881110	02																			
	881116	01																			
	881116	02																			
	881116	04																			
	881117	03																			
	881118	01																			
	881119	06																			
	881119	07																			
species 48	881024	03																1	100	1	100
	881111	05																			
	881201	03																			
species 49	881009	09																1	100	2	100
	881018	03																1	100	1	100
	881018	06																			
	881022	06																			
	881023	01																			
	881023	06																			
	881027	09																			
	881029	07																			
	881110	04																			
	881114	08																			
	881121	08																			
	881123	01																			
	881123	02																			
species 51	881017	04																2	100		
	881017	11																			
	881017	13																			
	881020	03																			
	881023	04																			

Table 4B. (continued)

		obs 4	obs 12	obs 31	obs 55	obs 56	obs 64	obs 67	obs 69
	date	sight no.	best est.	pct est.	best est.	pct est.	best est.	pct est.	best est.
species 51	881026	05				1 100			3 100
	881026	10				3 100			
	881026	13				4 100			
	881029	03				2 100			
	881108	02							3 100
	881108	09							
	881109	08							5 100
	881112	03							
	881115	01							
	881115	08							
	881120	04							
	881123	03							
species 61	881013	01				1 100			
	881018	14							7 100
	881023	02				1 100			
	881027	08							
	881110	05							
	881111	04							
	881111	07							
	881117	02							
	881120	01							
	881124	04							
species 70	881009	03				1 100			
	881017	12							
	881021	04				1 100			
	881026	12							
	881027	13							
	881111	08							
	881114	02							
	881114	07							
	881115	02							
	881115	03							
	881115	07							
	881117	04							
	881126	01							
	881126	03							
	881126	04							
	881128	03							
	881128	04							
	881201	02							
species 71	881203	04							1 100

Table 4B. (continued)

date	sight no.	obs 4		obs 12		obs 31		obs 55		obs 56		obs 64		obs 67		obs 69	
		best est.	pct														
species 72	881020	08						2	100					2	100		
	881111	06						1	100					1	100		
	881117	05						1	100	1	100			1	100		
	881129	02				2	100			2	100			2	100		
species 75	881021	08								5	100						
species 76	881021	06						2	100			2	100			2	100
species 77	881007	05						2	100		1	100					
	881009	02						10	100			1	100			70	100
	881014	03										1	100				
	881014	04															
	881016	01														50	100
	881017	02						20	100								
	881017	03															
	881018	10															
	881021	12															
	881022	01						1	100		2	100					
	881026	03															
	881027	02															
	881027	05						2	100								
	881027	07															
	881028	02															
	881109	09															
	881112	02														1	100
	881118	05								3	100					1	100
	881127	03														15	100
	881127	04								6	100						
	881127	07															
species 78	881029	06													2	100	
	881108	08													1	100	
	881116	05							1	100					1	100	
	881119	03													1	100	
	881121	07															
	881123	05								1	100						
	881124	01															
	881124	02															
	881127	08															
species 79	881113	01													1	100	
	881115	05													1	100	
	881115	09															

Table 4B. (continued)

		obs 4	obs 12	obs 31	obs 55	obs 56	obs 64	obs 67	obs 69
	date	sight no.	best est.	pct	best est.	pct	best est.	pct	best est.
species 79	881118	06							
species 96	881019	01							
	881020	01							
	881024	02							
	881026	07							
	881109	06							
	881109	07							
	881110	09							
	881126	06	1	100					
species 98	881008	04							
	881009	01							
	881009	04							
	881014	07							
	881020	09							
	881026	04							
	881124	03							

Table 5. Summary of marine mammal sightings encountered in the eastern tropical Pacific during July 28 through December 6, 1988.

species name (scientific name)	species code	species sightings			estimated-mean-school-size	
		total	pure	mixed	low / (n)	high / (n)
OFFSHORE SPOTTED DOLPHIN (<i>STENELLA ATTENUATA</i>)	2	35	15	20	139.08(35)	182.66(34)
SPINNER DOLPHIN (<i>STENELLA LONGIROSTRIS</i>)	3	2	0	2	13.04(2)	14.75(1)
COMMON DOLPHIN (<i>DELPHINUS DELPHIS</i>)	5	30	28	2	468.87(30)	649.47(28)
EASTERN SPINNER DOLPHIN (<i>STENELLA LONGIROSTRIS</i>)	10	2	0	2	115.07(2)	160.97(2)
WHITEBELLY SPINNER DOLPHIN (<i>STENELLA LONGIROSTRIS</i>)	11	29	11	18	89.87(29)	135.23(28)
STRIPED DOLPHIN (<i>S. COERULEOALBA</i>)	13	90	82	8	59.11(90)	87.37(89)
ROUGH-TOOTHED DOLPHIN (<i>STENO BREDAENSIS</i>)	15	10	8	2	20.14(10)	26.48(10)
BOTTLENOSED DOLPHIN (<i>TURSIOPS TRUNCATUS</i>)	18	24	10	14	20.12(24)	32.92(23)
RISSO'S DOLPHIN (<i>GRAMPUS GRISEUS</i>)	21	24	19	5	10.15(24)	13.59(22)
PACIFIC WHITE-SIDED DOLPHIN (<i>LAGENORHYNCHUS OBliquidens</i>)	22	2	1	1	78.50(2)	112.50(2)
DUSKY DOLPHIN (<i>L. obscurus</i>)	25	1	1	0	6.00(1)	8.00(1)
FRASER'S DOLPHIN (<i>LAGENODELPHIS HOSEI</i>)	26	2	2	0	312.00(2)	532.00(2)
UNIDENTIFIED DOLPHIN	77	97	89	8	11.27(91)	51.19(30)
totals	348	266			23.84(37)	

Table 5. (continued)

species name (scientific name)	species code	species total	sightings pure	sightings mixed	estimated low / (n)	mean high / (n)	school-size best / (n)
MELON-HEADED WHALE (PEIRONOCERPHALA ELECTRA)	31	1	1	0	187.00(1)	300.00(1)	242.00(1)
PYGMY KILLER WHALE (FERESA ATTENUATA)	32	2	1	1	8.24(2)	13.34(2)	10.34(2)
FALSE KILLER WHALE (PSEUDORCA CRASSIDENS)	33	1	1	0	5.00(1)	9.00(1)	7.00(1)
PILOT WHALE (GLOBICEPHALA SP.)	34	24	11	13	11.83(24)	17.43(21)	14.43(22)
KILLER WHALE (ORCINUS ORCA)	37	9	7	2	6.89(9)	9.15(9)	7.46(9)
SPERM WHALE (PHYSETTER MACROCEPHALUS)	46	20	19	1	10.24(20)	12.24(17)	10.33(18)
PYGMY SPERM WHALE (KOGIA BREVICEPS)	47	1	1	0	1.00(1)	1.00(1)	1.00(1)
DWARF SPERM WHALE (KOGIA SIMIUS)	48	7	6	1	1.43(7)	1.60(7)	1.43(7)
BEAKED WHALE (ZIPHIID)	49	16	16	0	1.31(16)	1.44(16)	1.31(16)
UNID. MESOPLODONT (MESOPODON SP.)	51	23	23	0	2.83(23)	3.43(23)	2.96(23)
CUVIER'S BEAKED WHALE (ZIPHIUS CAVIROSTRIS)	61	12	12	0	2.50(12)	3.08(12)	2.67(12)
RORQUAL (BALAENOPTERA SP.)	70	27	0	1.11(27)	1.23(26)	1.12(26)	
MINKE WHALE (B. ACUTOROSTRATA)	71	1	1	0	1.00(1)	1.00(1)	1.00(1)
BRYDE'S WHALE (B. EDENTI)	72	7	7	0	2.00(7)	2.14(7)	2.00(7)
BLUE WHALE (B. MUSCULUS)	75	1	1	0	5.00(1)	5.00(1)	5.00(1)
HUMPBACK WHALE (MEGAPTERA NOVAFANGALIAE)	76	3	3	0	2.00(3)	2.00(3)	2.00(3)
UNIDENTIFIED SMALL WHALE	78	18	0	1.35(17)	1.18(11)	1.21(14)	
UNIDENTIFIED LARGE WHALE	79	8	8	0	1.00(8)	1.14(7)	1.00(8)
UNIDENTIFIED CETACEAN	96	14	14	0	1.21(14)	1.22(9)	1.22(9)
UNIDENTIFIED WHALE	98	22	22	0	1.24(21)	1.32(19)	1.21(19)
totals	217	199					

Table 6. Summary of distance searched, dolphin schools detected, and rates of encountering dolphins by observers aboard the McArthur in the eastern tropical Pacific during July 28 through December 6, 1988.

	Distance Searched (km)	Percent Distance Searched	Number Schools Detected	Percent Schools Detected	Detection Rate (Schools/ 1000 km)	S.E. Detection Rate	Number Days Searched
All Data	12349	100	281	100	22.76	2.22	90
Inshore	2429	20	52	19	21.41	3.69	17
Middle	2589	21	56	20	21.63	5.17	20
West	2549	21	65	23	25.50	4.49	26
South	4781	39	108	38	22.59	5.33	31
Sea State Conditions							
Calm	1213	10	57	20	47.01	7.92	21
Rough	11136	90	224	80	20.11	2.11	86
Visibility Conditions							
Good	10942	89	243	86	22.21	2.43	90
Poor	1407	11	38	14	27.01	4.82	54
Observers							
5	2571	21	18	6	7.00	1.66	39
22	2622	21	4	1	1.53	0.73	39
31	3408	28	32	11	9.39	2.18	49
38	2645	21	23	8	8.70	2.39	41
51	2661	22	21	7	7.89	1.84	41
55	3667	30	45	16	12.27	2.56	48
56	3667	30	25	9	6.81	1.60	48
64	3408	19	26	9	7.63	1.63	49
67	3667	30	16	6	4.36	1.06	48
68	2636	21	23	8	8.73	1.86	41
69	3320	27	31	11	9.34	1.78	48
70	2629	21	17	6	6.47	1.63	39

Table 6. (continued)

Teams ²	Distance Searched (km)	Percent Distance Searched	Number Schools Detected	Percent Schools Detected	Detection Rate (Schools/ 1000 km)		S.E.	Days Searched	Number ¹
					Detection Rate	S.E.			
Teams²									
Team 1	2571	21	38	14	14.28	2.50			39
Team 2	3408	28	89	32	26.12	4.24			49
Team 3	2645	21	67	24	25.33	4.14			41
Team 4	3667	30	86	31	23.45	3.43			48

¹Day included in tally of searching effort if variable occurred during any part of the day.

²Team 1 members were observers 5, 22, 70; Team 2 members were observers 31, 64, 69; Team 3 members were observers 38, 51, 68; and Team 4 members were observers 55, 56, 67. 57.99nm of trackline was searched when either both or neither of the team leaders were on duty and is not used for team analysis.

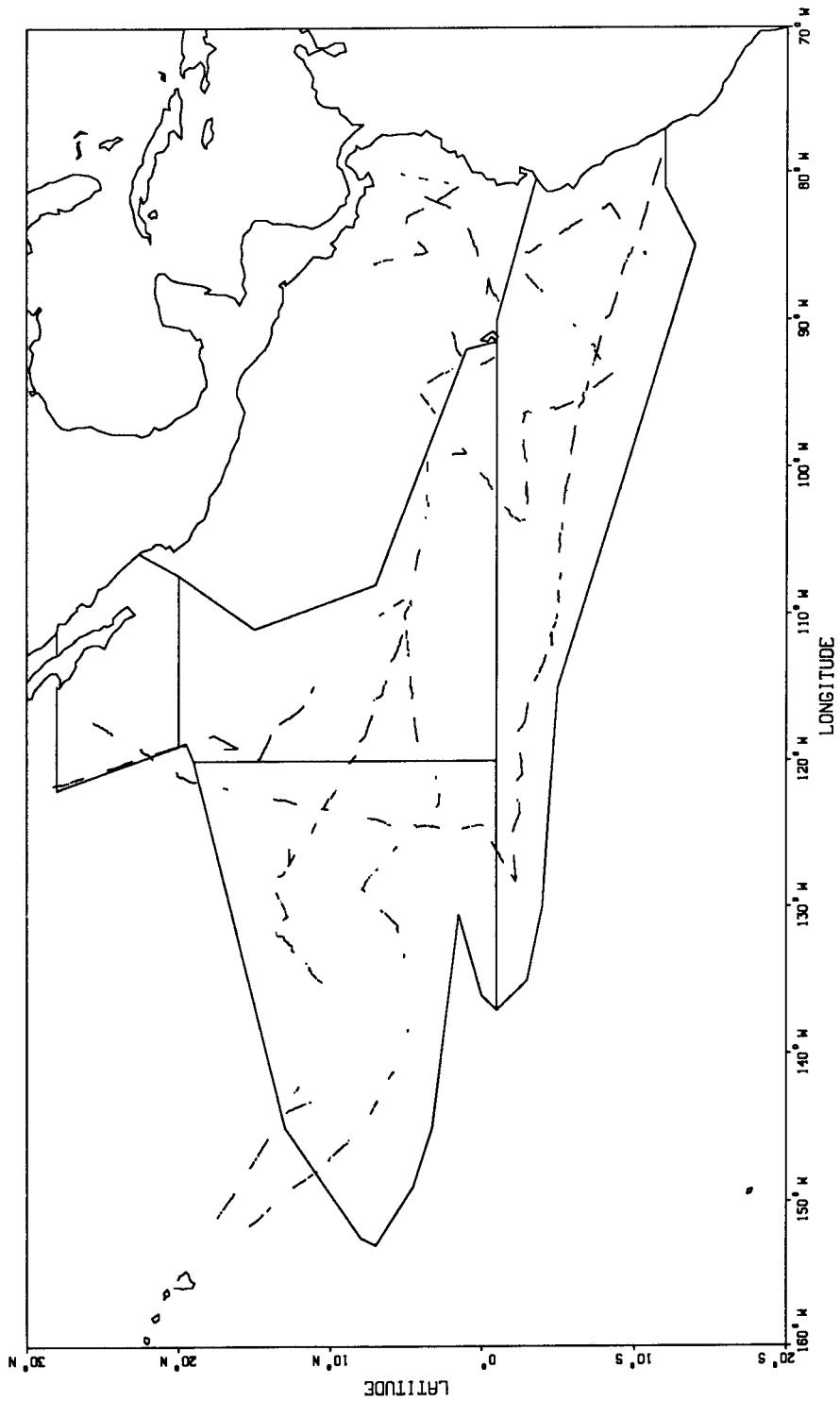


Figure 1. Tracklines surveyed by the NOAA ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

CRUISE #	YEAR	MONTH	DAY
1	4	6	8

**RESEARCH SHIP
MARINE MAMMAL
DAILY EFFORT RECORD**

SERIES #	LEG #	START OF LEG				COMPASS COURSE °T	VESSEL SPEED KTS & 10ths	POSITION: ONE OR MORE PER SERIES			OBSERVER POSITION			CODE END LEG
		SURFACE TEMP. °F & 10ths	# 33	HORZ SUN	VERT SUN			N S	LATITUDE	E W	LEFT BND.	RIGHT BND.	REC.	
1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
4	4	-	-	-	-	-	-	-	-	-	-	-	-	-
5	5	-	-	-	-	-	-	-	-	-	-	-	-	-
6	6	-	-	-	-	-	-	-	-	-	-	-	-	-
7	7	-	-	-	-	-	-	-	-	-	-	-	-	-
8	8	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9	-	-	-	-	-	-	-	-	-	-	-	-	-
10	10	-	-	-	-	-	-	-	-	-	-	-	-	-
11	11	-	-	-	-	-	-	-	-	-	-	-	-	-
12	12	-	-	-	-	-	-	-	-	-	-	-	-	-
13	13	-	-	-	-	-	-	-	-	-	-	-	-	-
14	14	-	-	-	-	-	-	-	-	-	-	-	-	-
15	15	-	-	-	-	-	-	-	-	-	-	-	-	-
16	16	-	-	-	-	-	-	-	-	-	-	-	-	-
17	17	-	-	-	-	-	-	-	-	-	-	-	-	-
18	18	-	-	-	-	-	-	-	-	-	-	-	-	-
19	19	-	-	-	-	-	-	-	-	-	-	-	-	-
20	20	-	-	-	-	-	-	-	-	-	-	-	-	-
21	21	-	-	-	-	-	-	-	-	-	-	-	-	-
22	22	-	-	-	-	-	-	-	-	-	-	-	-	-
23	23	-	-	-	-	-	-	-	-	-	-	-	-	-
24	24	-	-	-	-	-	-	-	-	-	-	-	-	-
25	25	-	-	-	-	-	-	-	-	-	-	-	-	-
26	26	-	-	-	-	-	-	-	-	-	-	-	-	-
27	27	-	-	-	-	-	-	-	-	-	-	-	-	-
28	28	-	-	-	-	-	-	-	-	-	-	-	-	-
29	29	-	-	-	-	-	-	-	-	-	-	-	-	-
30	30	-	-	-	-	-	-	-	-	-	-	-	-	-
31	31	-	-	-	-	-	-	-	-	-	-	-	-	-
32	32	-	-	-	-	-	-	-	-	-	-	-	-	-
33	33	-	-	-	-	-	-	-	-	-	-	-	-	-
34	34	-	-	-	-	-	-	-	-	-	-	-	-	-
35	35	-	-	-	-	-	-	-	-	-	-	-	-	-
36	36	-	-	-	-	-	-	-	-	-	-	-	-	-
37	37	-	-	-	-	-	-	-	-	-	-	-	-	-
38	38	-	-	-	-	-	-	-	-	-	-	-	-	-
39	39	-	-	-	-	-	-	-	-	-	-	-	-	-
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41	41	-	-	-	-	-	-	-	-	-	-	-	-	-
42	42	-	-	-	-	-	-	-	-	-	-	-	-	-
43	43	-	-	-	-	-	-	-	-	-	-	-	-	-
44	44	-	-	-	-	-	-	-	-	-	-	-	-	-
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51	51	-	-	-	-	-	-	-	-	-	-	-	-	-
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53	53	-	-	-	-	-	-	-	-	-	-	-	-	-
54	54	-	-	-	-	-	-	-	-	-	-	-	-	-
55	55	-	-	-	-	-	-	-	-	-	-	-	-	-

FOG/RAIN CODES
 NO FOG OR RAIN = 1
 FOG = 2
 RAIN = 3
 FOG AND RAIN = 4

ENDING CODES
 1 - COURSE CHANGE
 2 - SPEED CHANGE
 4 - EFFORT TERMINATED
 5 - LEG ENDS TO RECORD
 6 - POSITION IN FOLLOWING LEG
 8 - LEG ENDS DUE TO CHANGE IN
 ENVIRONMENTAL CONDITIONS

Figure 2. Research ship marine mammal daily effort record.

CRUISE =	YEAR	MONTH	DATE DAY	SIGHT #	SERIES #	LEG #	CARD #	
	1	4	6	8	10	12	14	16
							0	1

**RESEARCH SHIP
MARINE MAMMAL
SIGHTING RECORD**

SIGHTING CUE				ENVIR. COND. AT CUE				POSITION AT TIME OF CUE				OBSERVER POSITIONS							
TIME	BEARING FROM SHIP	DISTANCE nm & 10ths	2	SURF TEMP °F & 10ths	HORZ SUN	VERT SUN	N/S	LATITUDE	E/W	SUBJECT CODE	TIME M.M. SIGHTED	Y/N	LEFT BIND	RIGHT BIND	REC	DETILED BY			
18	22	23	24	27	30	31	34	36	38	42	43	48	49	50	54	55	57	59	61

OBSERVER 1

SCHOOL SIZE ESTIMATE				SPECIES PROPORTIONS							
OBS. CODE	BEST	HIGH	LOW	SPECIES 1	SP 1 CODE	SPECIES 2	SP 2 CODE	SPECIES 3	SP 3 CODE	SPECIES 4	SP 4 CODE
				0	2						
63	65	69	73	76	16	18	21	23	26	28	31
S, P, 1			S, P, 2			S, P, 3			S, P, 4		
36											

OBSERVER 2

SCHOOL SIZE ESTIMATE				SPECIES PROPORTIONS							
OBS. CODE	BEST	HIGH	LOW	SPECIES 1	SP 1 CODE	SPECIES 2	SP 2 CODE	SPECIES 3	SP 3 CODE	SPECIES 4	SP 4 CODE
38	40	44	48	52	55	57	60	62	65	67	70
S, P, 1			S, P, 2			S, P, 3			S, P, 4		
40											

OBSERVER 3

SCHOOL SIZE ESTIMATE				SPECIES PROPORTIONS								
OBS. CODE	BEST	CARD #	HIGH	LOW	SPECIES 1	SP 1 CODE	SPECIES 2	SP 2 CODE	SPECIES 3	SP 3 CODE	SPECIES 4	SP 4 CODE
		0	3									
72	74	77	16	18	22	26	29	31	34	36	39	41
S, P, 1			S, P, 2			S, P, 3			S, P, 4			
44												

OBSERVER 4

SCHOOL SIZE ESTIMATE				SPECIES PROPORTIONS							
OBS. CODE	BEST	HIGH	LOW	SPECIES 1	SP 1 CODE	SPECIES 2	SP 2 CODE	SPECIES 3	SP 3 CODE	SPECIES 4	SP 4 CODE
											0
46	48	52	56	60	63	65	68	70	73	75	77
S, P, 1			S, P, 2			S, P, 3			S, P, 4		
18											

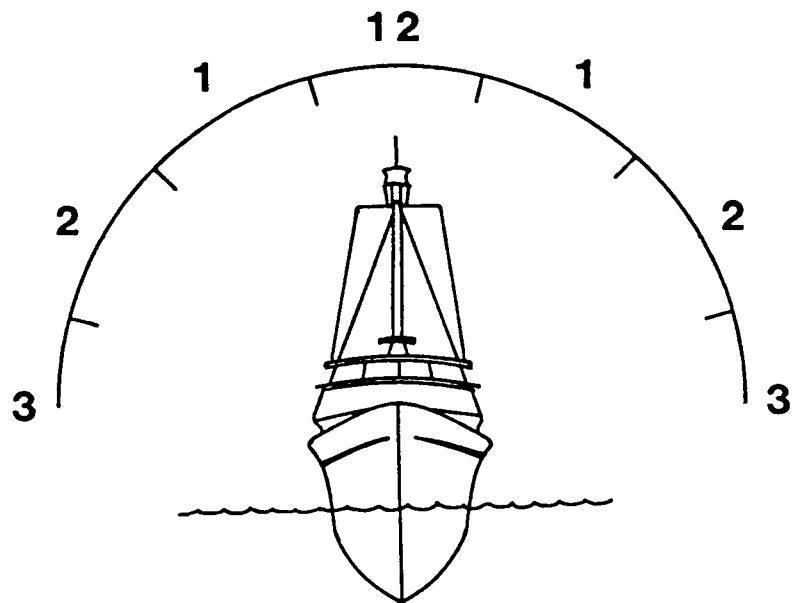
OBSERVER 5

SCHOOL SIZE ESTIMATE				SPECIES PROPORTIONS							
OBS. CODE	BEST	HIGH	LOW	SPECIES 1	SP 1 CODE	SPECIES 2	SP 2 CODE	SPECIES 3	SP 3 CODE	SPECIES 4	SP 4 CODE
20	22	26	30	34	37	39	42	44	47	49	52
S, P, 1			S, P, 2			S, P, 3			S, P, 4		
52											

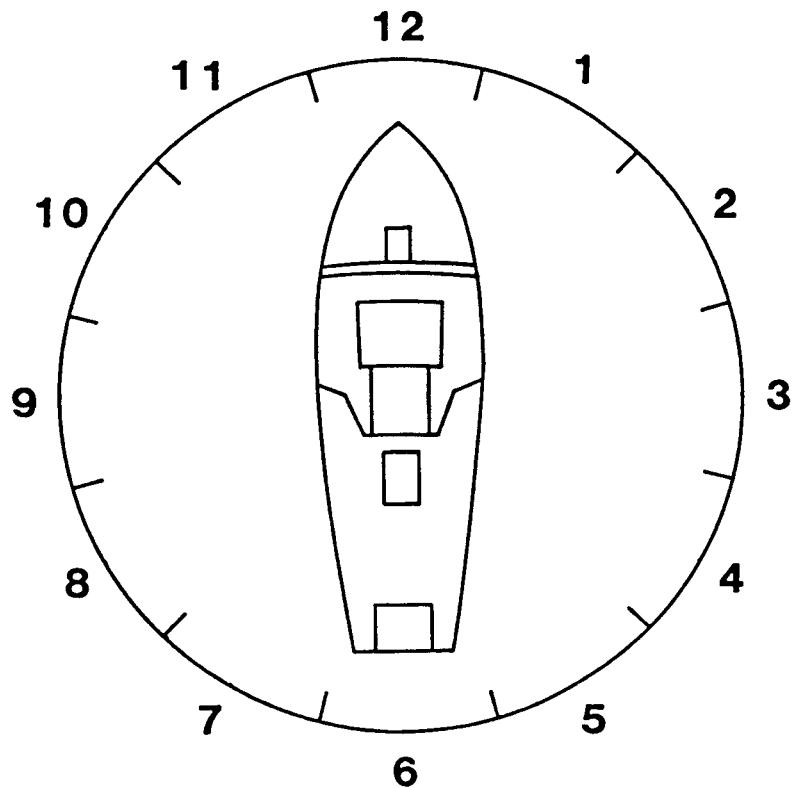
OBSERVER 6

SCHOOL SIZE ESTIMATE				SPECIES PROPORTIONS								
OBS. CODE	BEST	HIGH	LOW	SPECIES 1	SP 1 CODE	SPECIES 2	SP 2 CODE	CARD #	SPECIES 3	SP 3 CODE	SPECIES 4	SP 4 CODE
								0				
54	56	60	64	68	71	73	76	16	18	21	23	26
S, P, 1			S, P, 2			S, P, 3			S, P, 4			RC 1
33												RC 2
28												RC 3
29												RC 4
30												RC 5
31												RC 6

Figure 3. Research ship marine mammal sighting record.



VERTICAL SUN POSITION



HORIZONTAL SUN POSITION

Figure 4. Vertical and horizontal sun position categories.

CRUISE #	YEAR	DATE MONTH	DAY	SIGHT #	SERIES #	LEG #	OBS. CODE
1	4	6	8	10	12	14	16

SIGHTING SUMMARY

LIST ALL DIAGNOSTIC FEATURES OBSERVED
(INCLUDING ESTIMATED BODY LENGTH)

SKETCH FEATURES OF ANIMALS SIGHTED							

BEHAVIOR – (DESCRIBE AGGREGATION, MOVEMENT, BOW AND STERN RIDING, BLOWS, ETC.)

ASSOCIATED ANIMALS – (INCLUDE NUMBER AND SPECIES OF BIRDS)

PHOTOS: ROLL #

FRAME(S): *

TOTAL TIME OF OBSERVATION	ENVIR. COND. (RAIN, OVERCAST, FOG, CHOPPY)	CLOSEST DISTANCE OF OBSERVATION
AMT. OF TIME AT CLOSEST DISTANCE	TAGS ASSOCIATED WITH SIGHTING	METHOD OF OBSERVATION (EYE, 7x, 10x, 25x)

Figure 5. Research ship marine mammal sighting record continuation sheet.

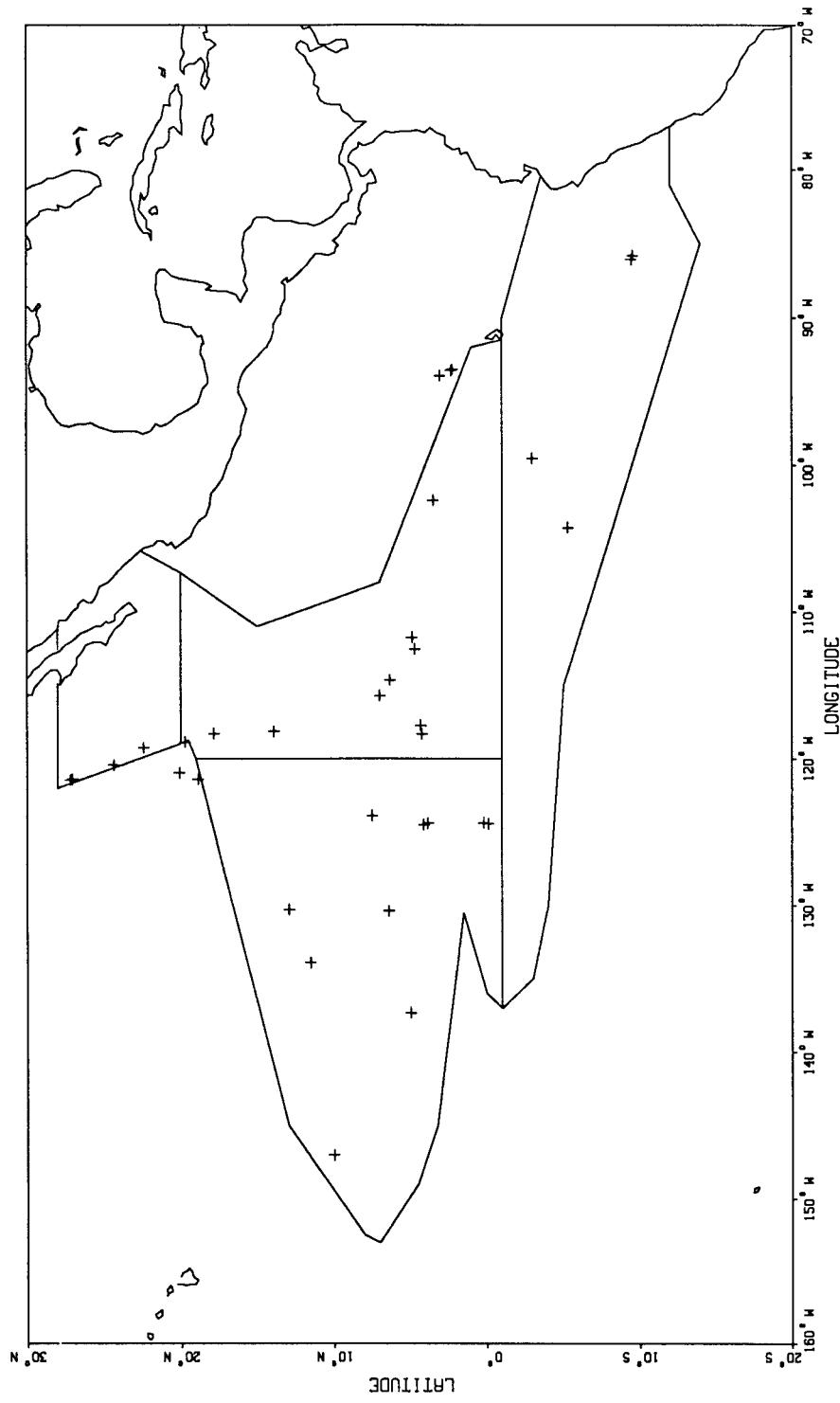


Figure 6. Offshore spotted dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

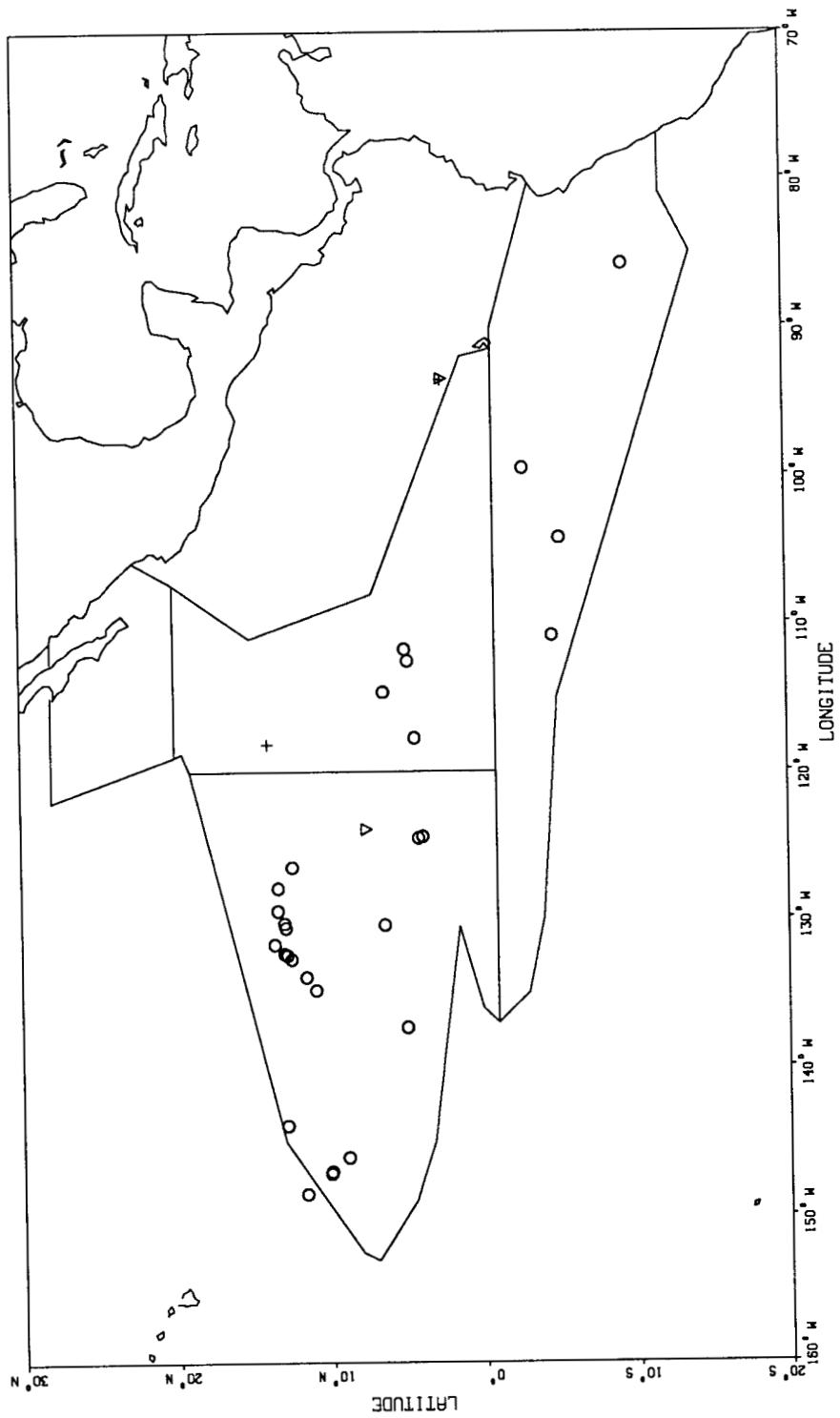


Figure 7. Eastern (+), whitebelly (o) and unidentified (▽) spinner dolphins detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

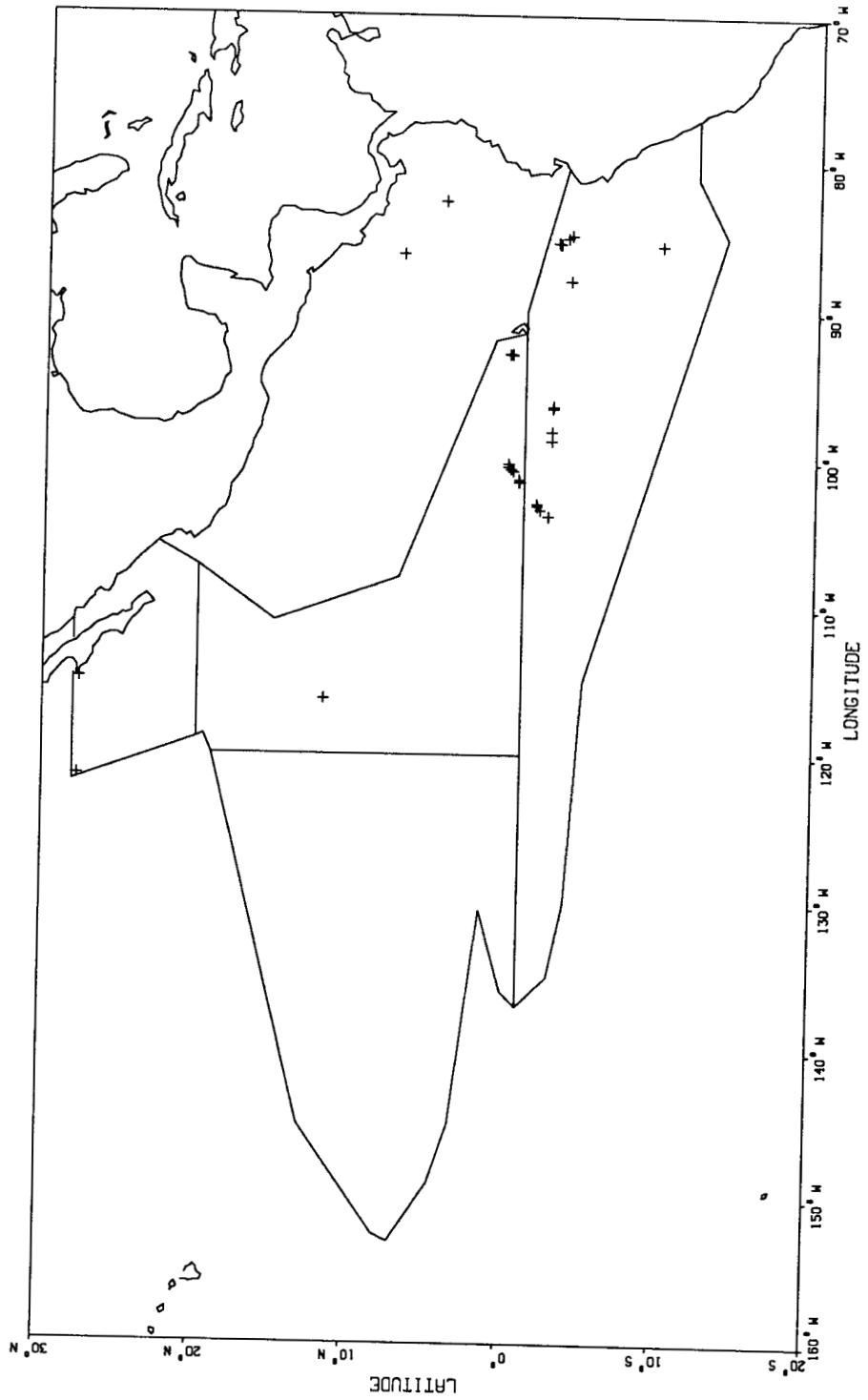


Figure 8. Common dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

114

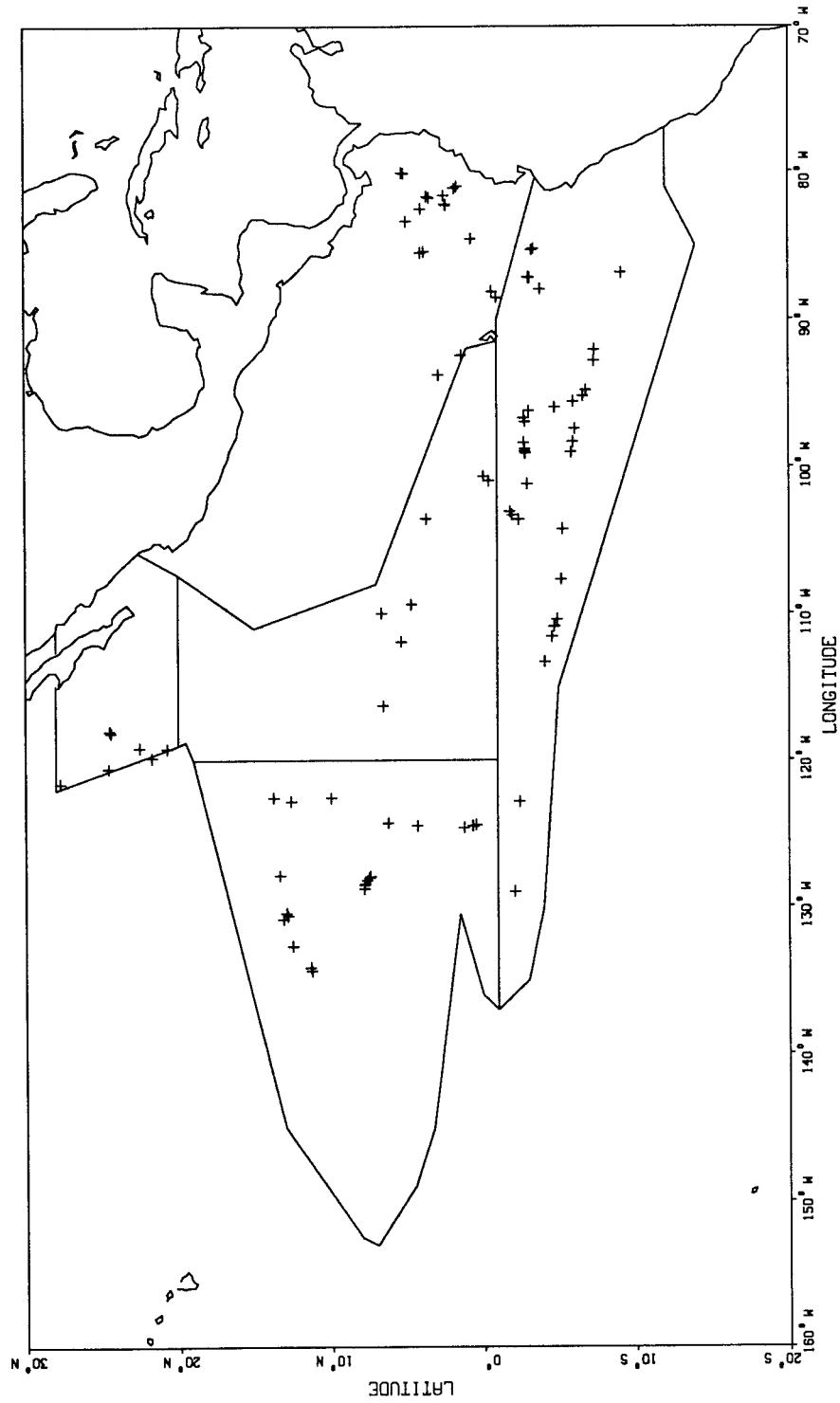


Figure 9. Striped dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

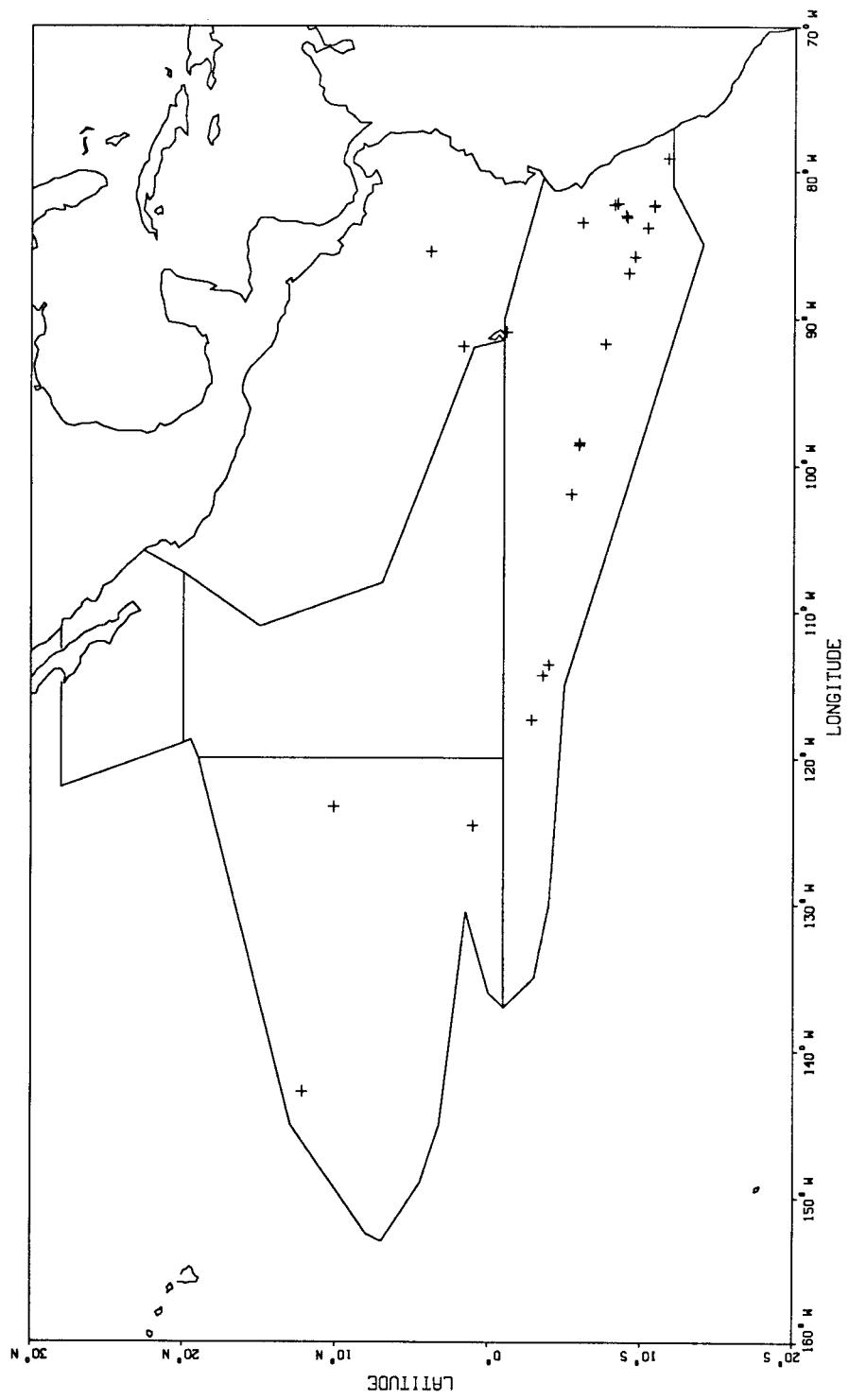


Figure 10. Bottlenose dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

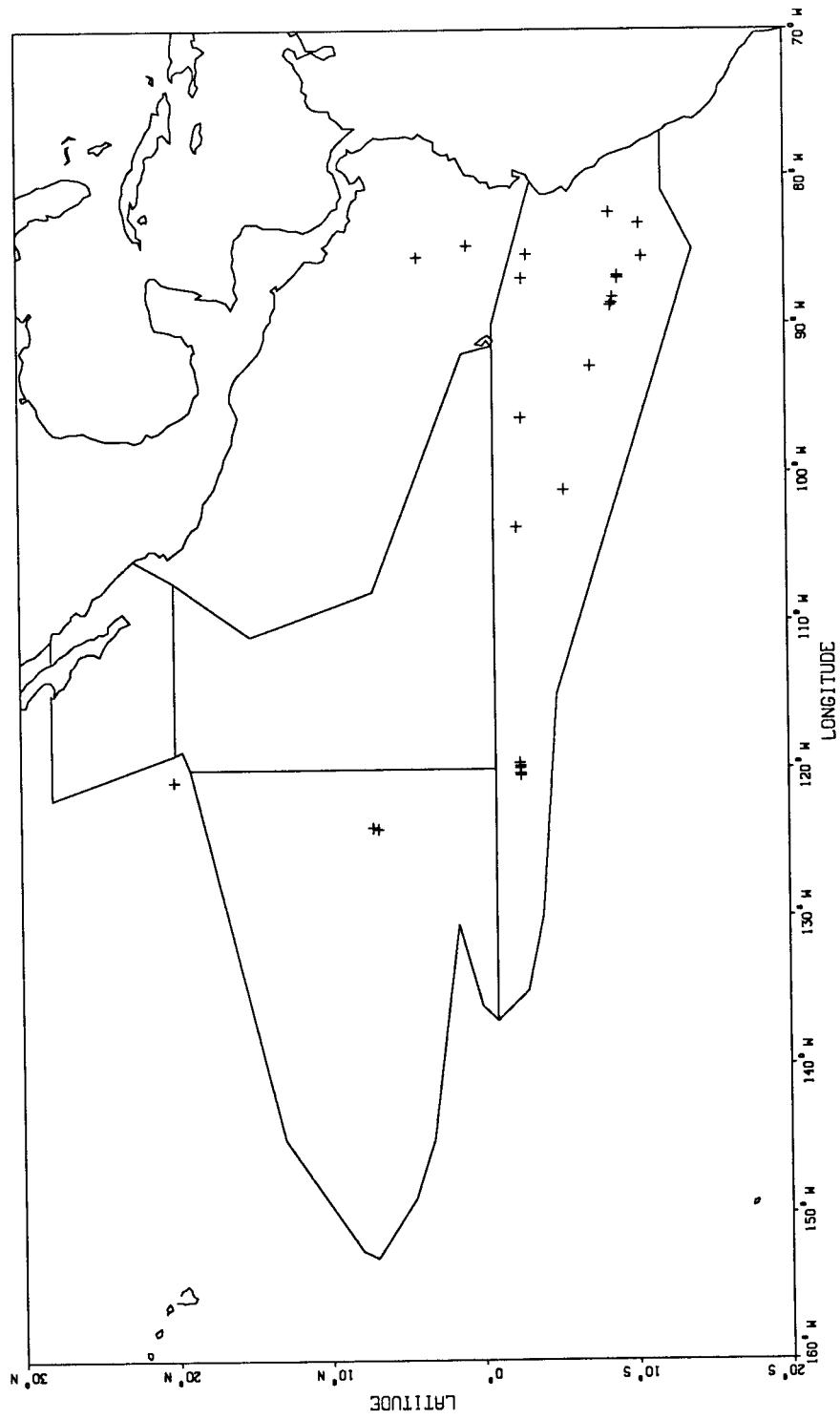


Figure 11. Risso's dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

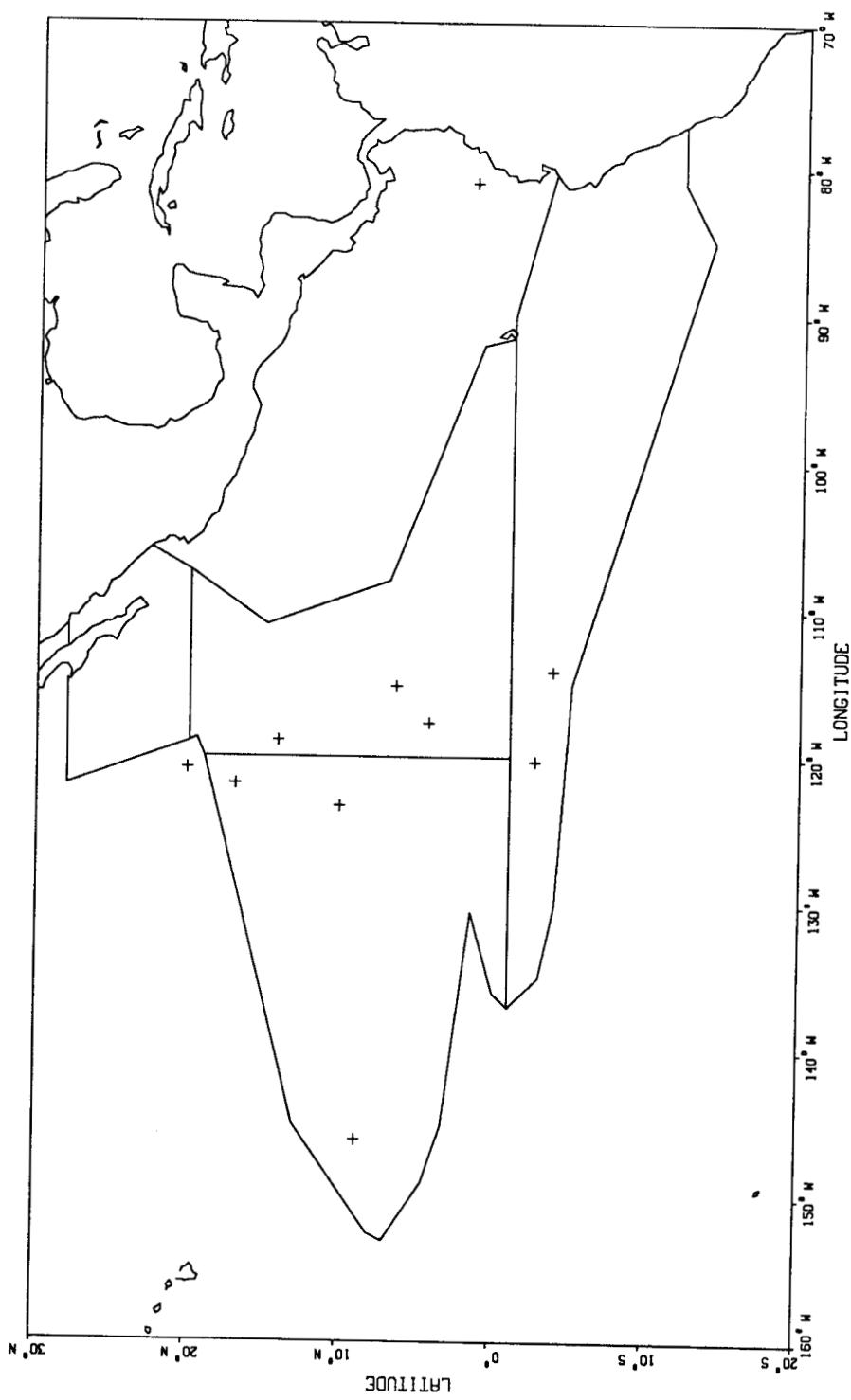


Figure 12. Rough-toothed dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

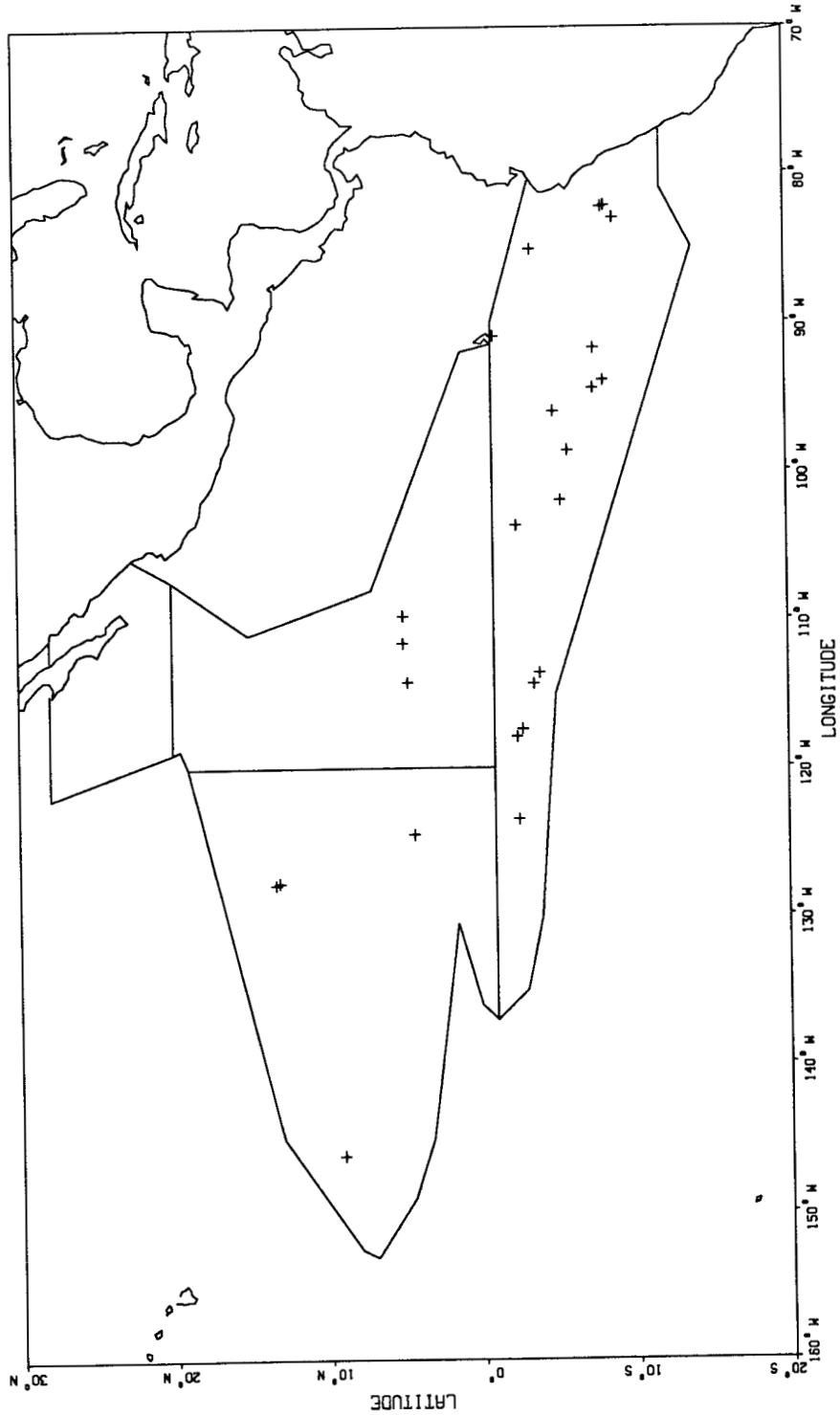


Figure 13. Pilot whales (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

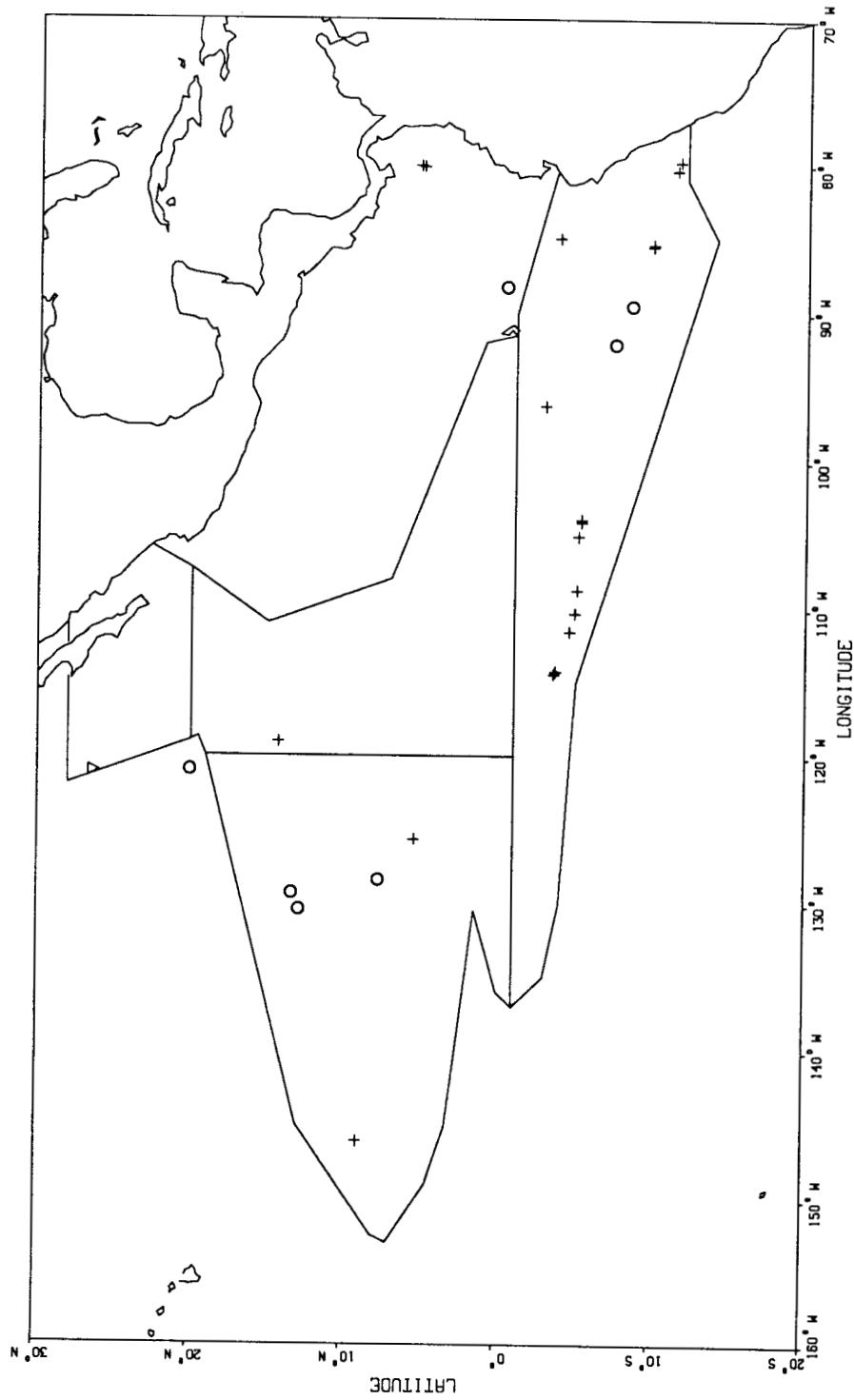


Figure 14. Sperm (+), dwarf sperm (○) and pygmy sperm (∇) whales detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

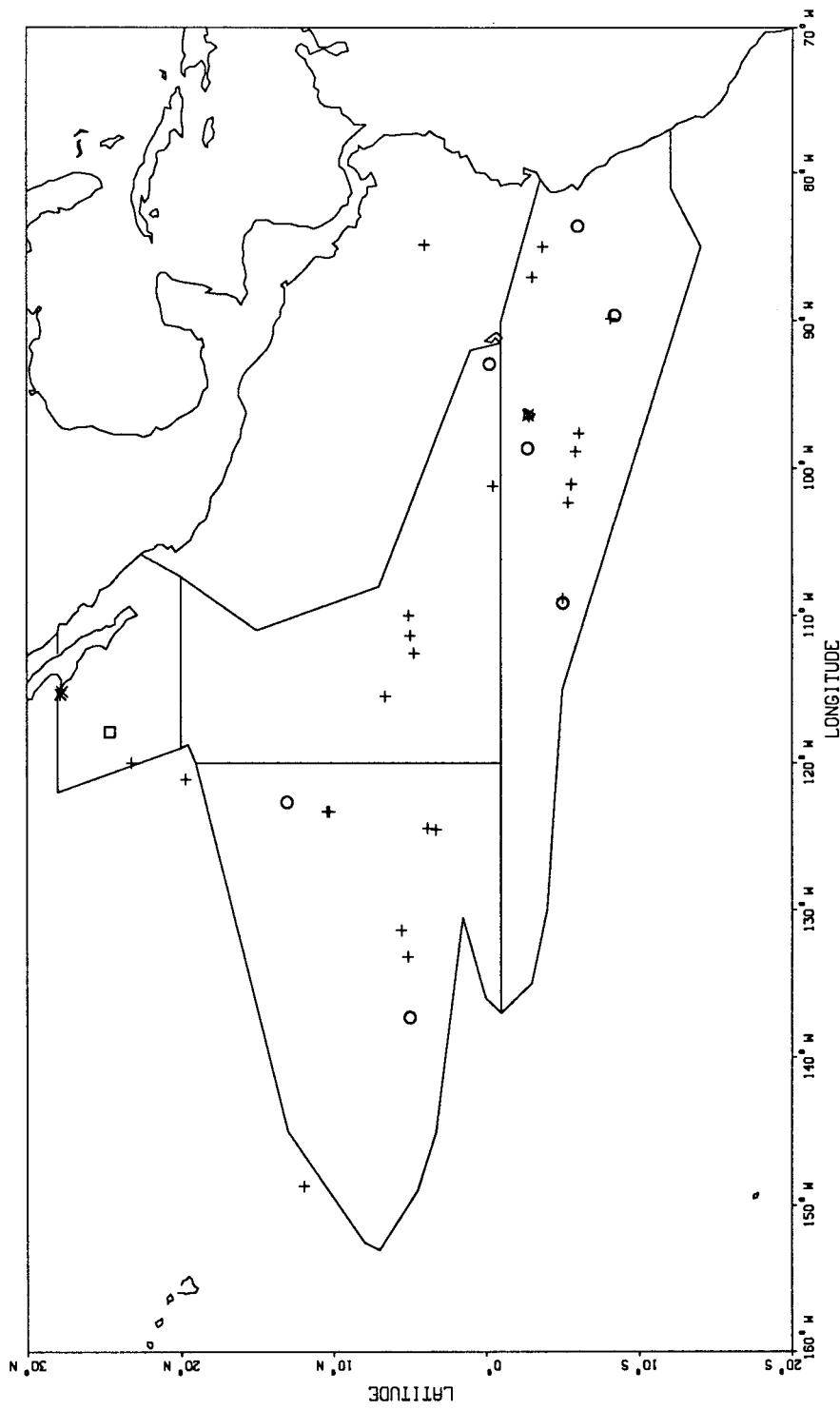


Figure 15. Unidentified rorquals (+), Bryde's (○), blue (∇), minke (\square) and humpback (*) whales detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

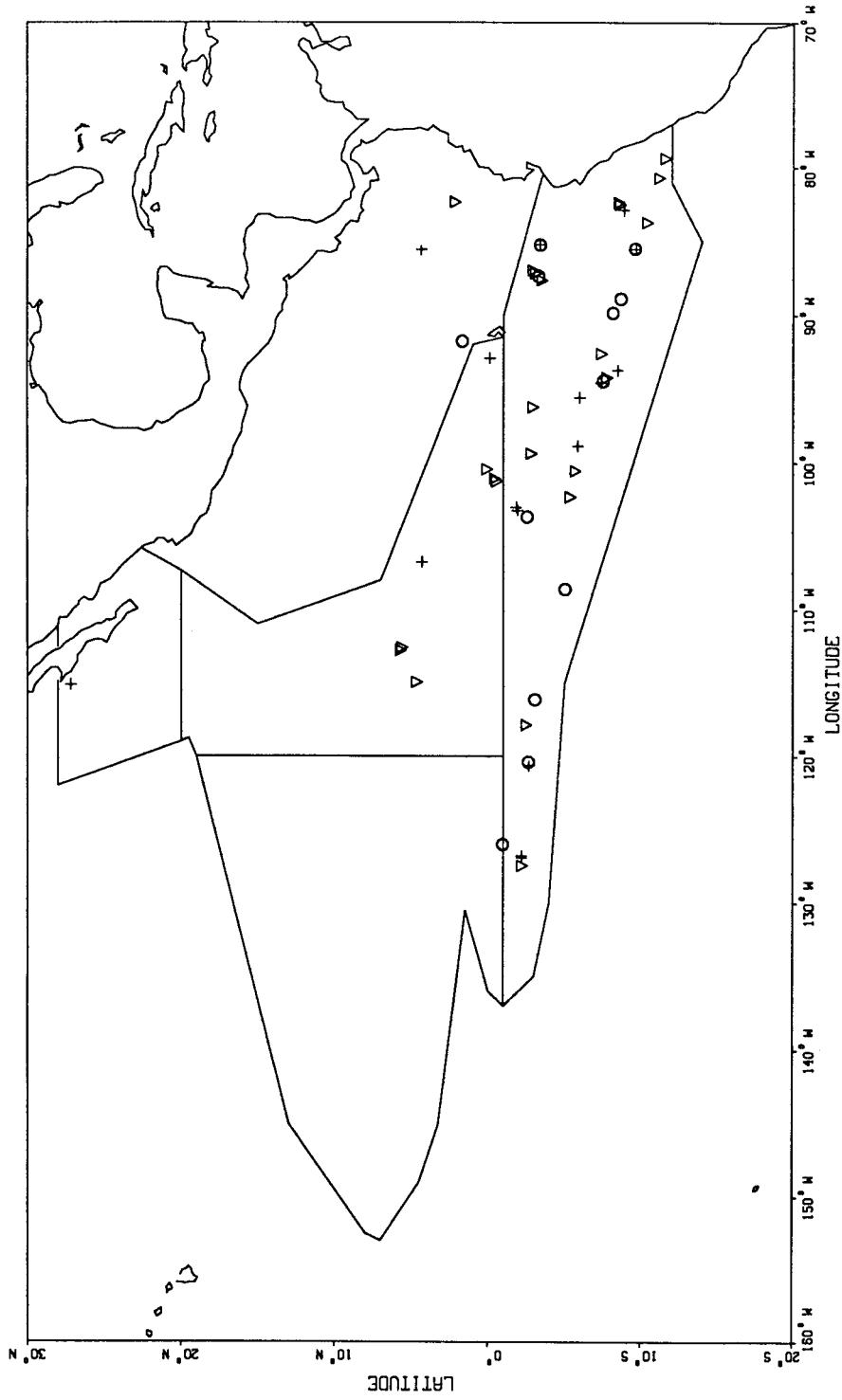


Figure 16. Unidentified beaked (+), Cuvier's beaked (o) and mesoplodon (∇) whales detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

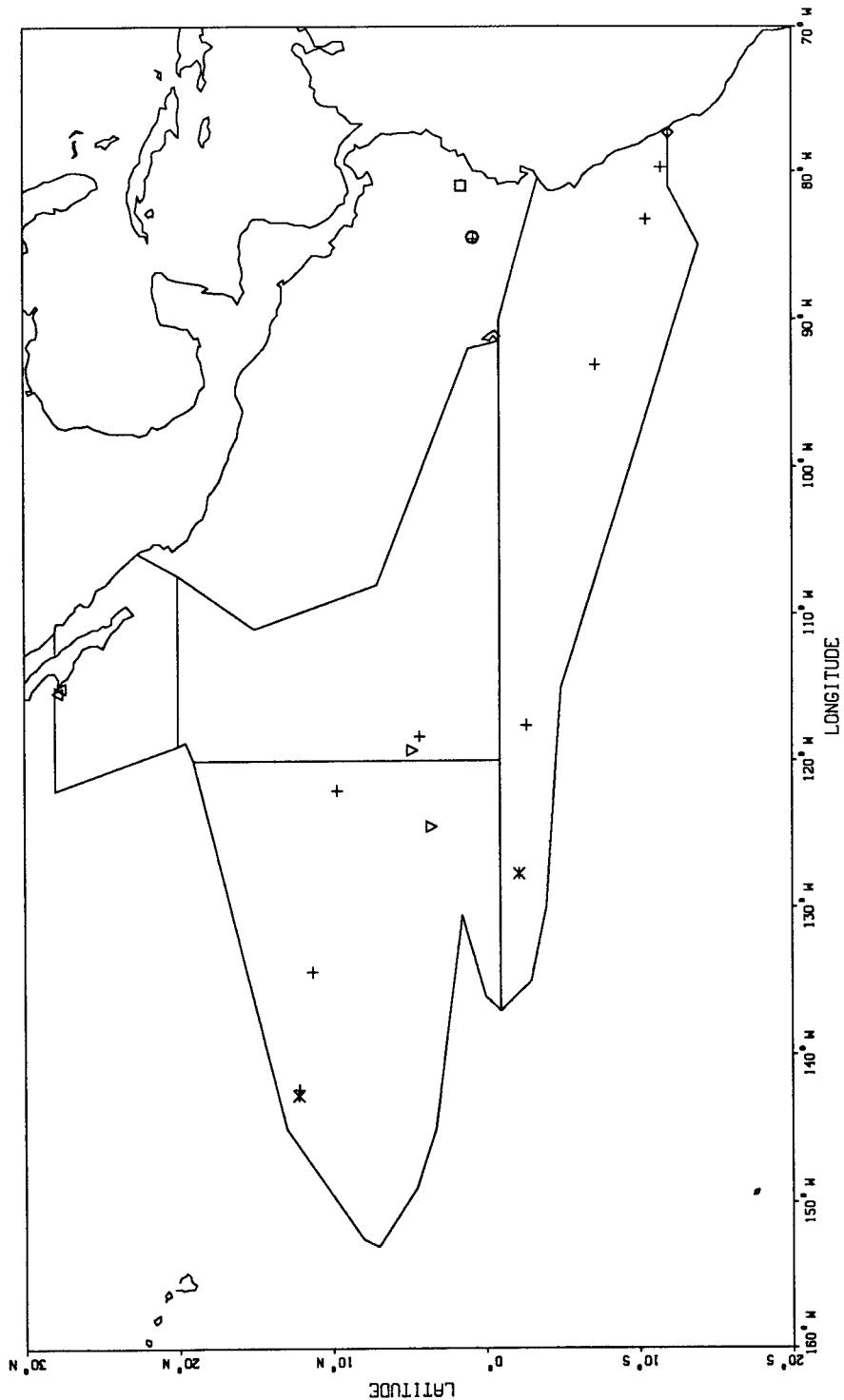


Figure 17. Killer (+) and false killer (○) whales, Fraser's dolphins (▽), melon-headed (□) and pygmy killer (✗) whales and Pacific white-sided (△) and dusky (◇) dolphins detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

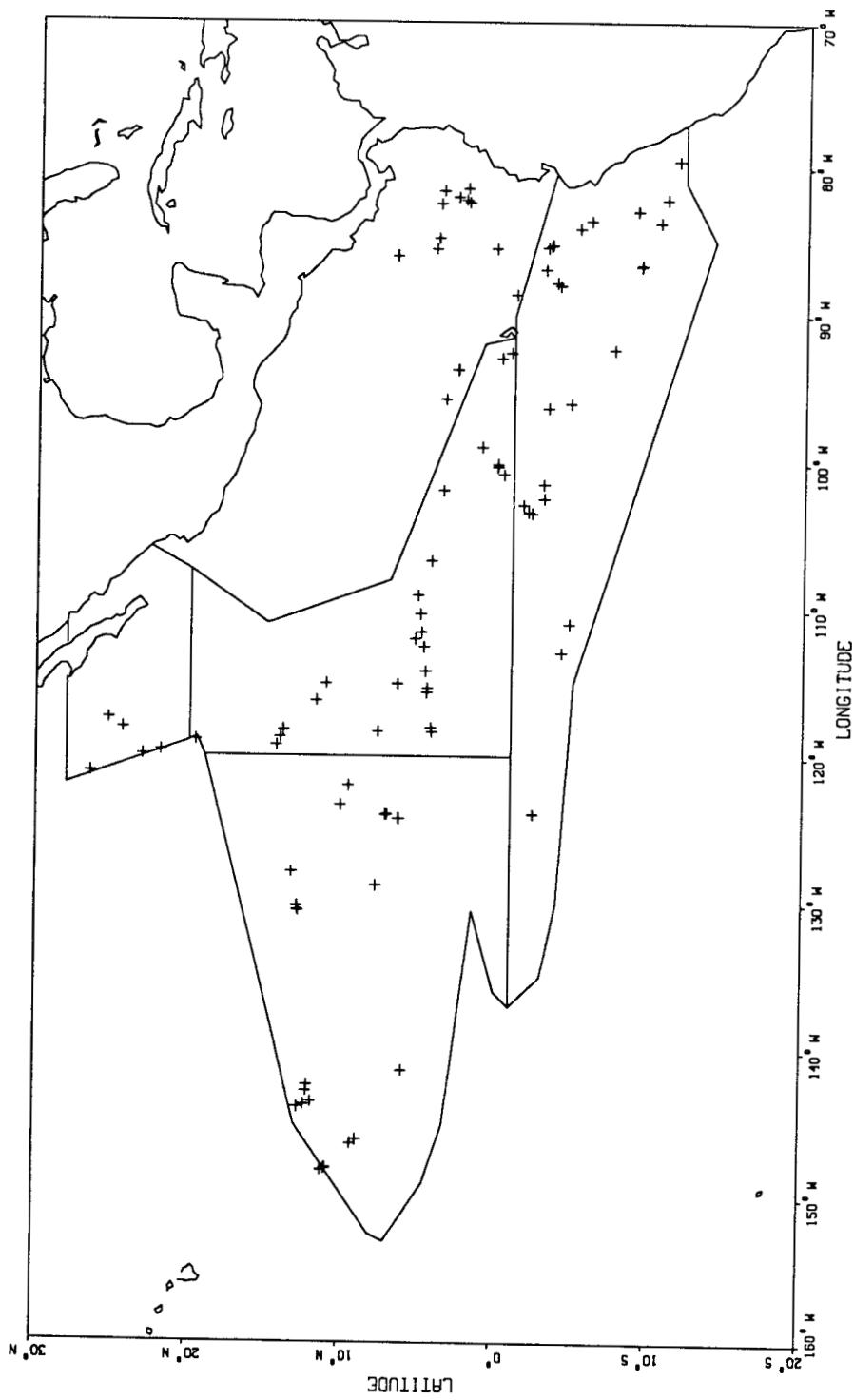


Figure 18. Unidentified dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

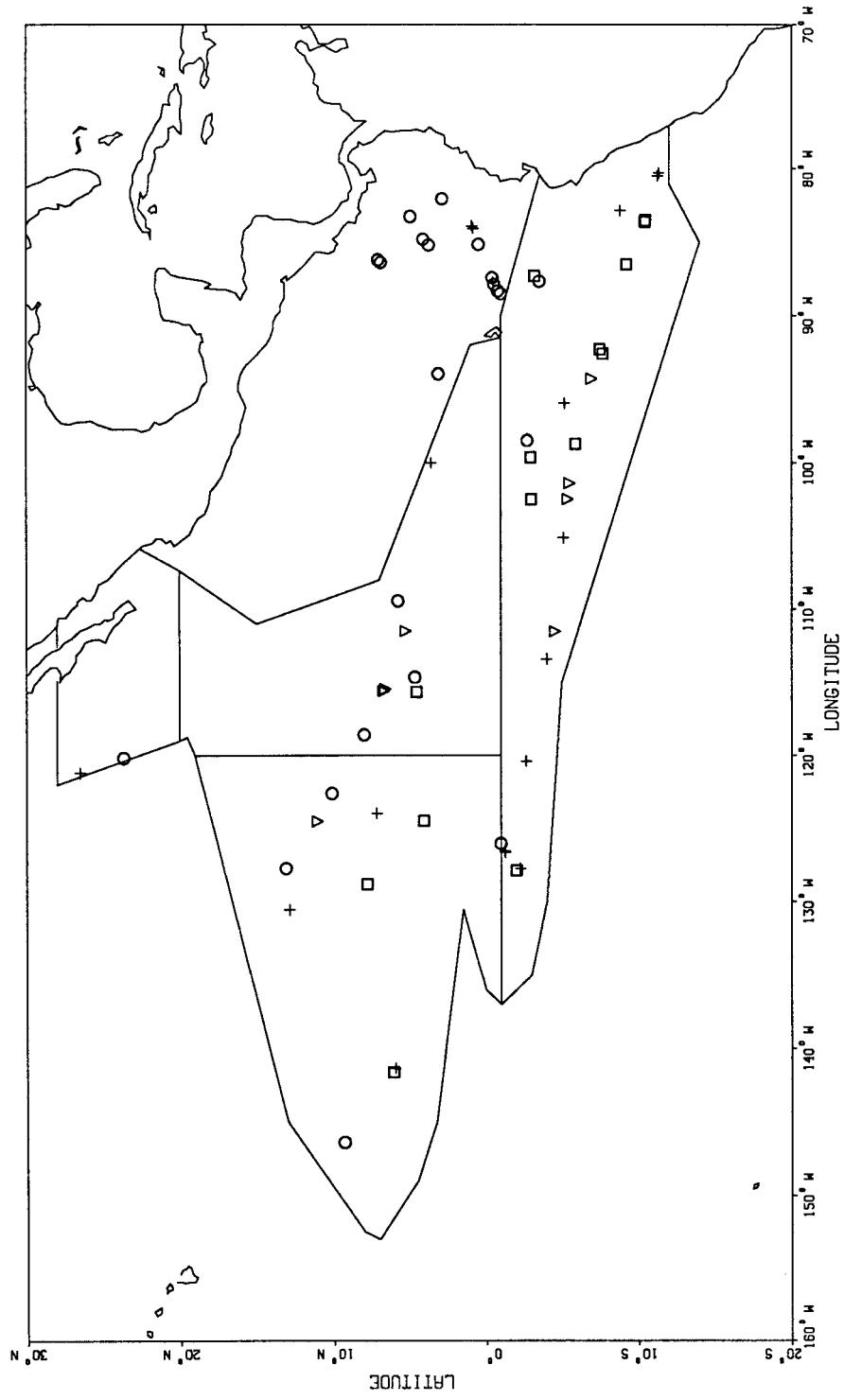


Figure 19. Unidentified small whales (+), unidentified whales (○), unidentified large whales (∇) and unidentified cetaceans (\square) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

NOAA Technical Memorandum NMFS

The National Oceanic and Atmospheric Administration (NOAA), organized in 1970, has evolved into an agency which establishes national policies and manages and conserves our oceanic, coastal, and atmospheric resources. An organizational element within NOAA, the Office of Fisheries is responsible for fisheries policy and the direction of the National Marine Fisheries Service (NMFS).

In addition to its formal publications, the NMFS uses the NOAA Technical Memorandum series to issue informal scientific and technical publications when complete formal review and editorial processing are not appropriate or feasible. Documents within this series, however, reflect sound professional work and may be referenced in the formal scientific and technical literature.